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ABSTRACT

To reduce the number of deaths and injuries caused by fires, this catalog (which is part of the Map and Hazard Series) gives information about typical accident patterns and about the safest way to purchase, use, store, maintain, and dispose of flammable products. As a reference source, it is intended for use in formal teaching situations as well as in informal situations such as business and social groups. Ten topics are covered, as follows: (1) electricity which presents the hazards of shock and fire; (2) combustion and explosive mixtures and their chemical reactions; (3) matches; (4) space heaters, their various types and dangers; (5) extension and replacement cords and how to interpret their electrical ratings; (6) flammable fabrics, their various types and federal legislation governing their use; (7) ovens and cooking ranges; (8) fireplaces; (9) flammable liquids such as alcohol, turpentine, kerosene, and gasoline; and (10) lighters. Quizzes, games, graphic illustrations, autobiographical experiences, and lists of do's and don'ts or Maps and Hazards are included throughout the ten chapters. In the appendix is a list of sources for more information. (ELG)

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Fire in Your Life:
A Catalog of Flammable Products & Ignition Sources

U.S. Consumer Product Safety Commission
Washington, D.C. 20207

U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

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The U.S. Consumer Product Safety Commission

Each year in the United States approximately 21 million people are injured and around 25,000 killed in home accidents. The majority of these injuries and deaths are product related. The annual cost of home injuries exceeds 5.6 billion dollars.

Congress recognized the urgent need for Federal regulations to ensure safer consumer products when it passed the Consumer Product Safety Act in 1972. The Act called for the creation of a new, independent Federal regulatory agency. The U.S. Consumer Product Safety Commission was activated on May 14, 1973 and directed by Congress to:

—protect the public against unreasonable risks of injury associated with consumer products;

—assist consumers in evaluating the comparative safety of consumer products;

—develop uniform safety standards for consumer products and to minimize conflicting State and local regulations; and

—promote research and investigation into causes and prevention of product-related deaths, illnesses, and injuries.

The Commission has jurisdiction over more than 10,000 products used in the home, school, and public places. In its efforts to protect the public from serious product-associated injuries, the Commission needs the help of every consumer, young and old.

To report a hazard or a product-related injury, write to the U.S. Consumer Product Safety Commission, Washington, D.C. 20207. In the continental United States, call the toll-free hotline—800-638-2666. Maryland residents only, call 800-492-2937.

CE

WHERE TO GO FOR WHAT YOU NEED TO KNOW ABOUT . . .

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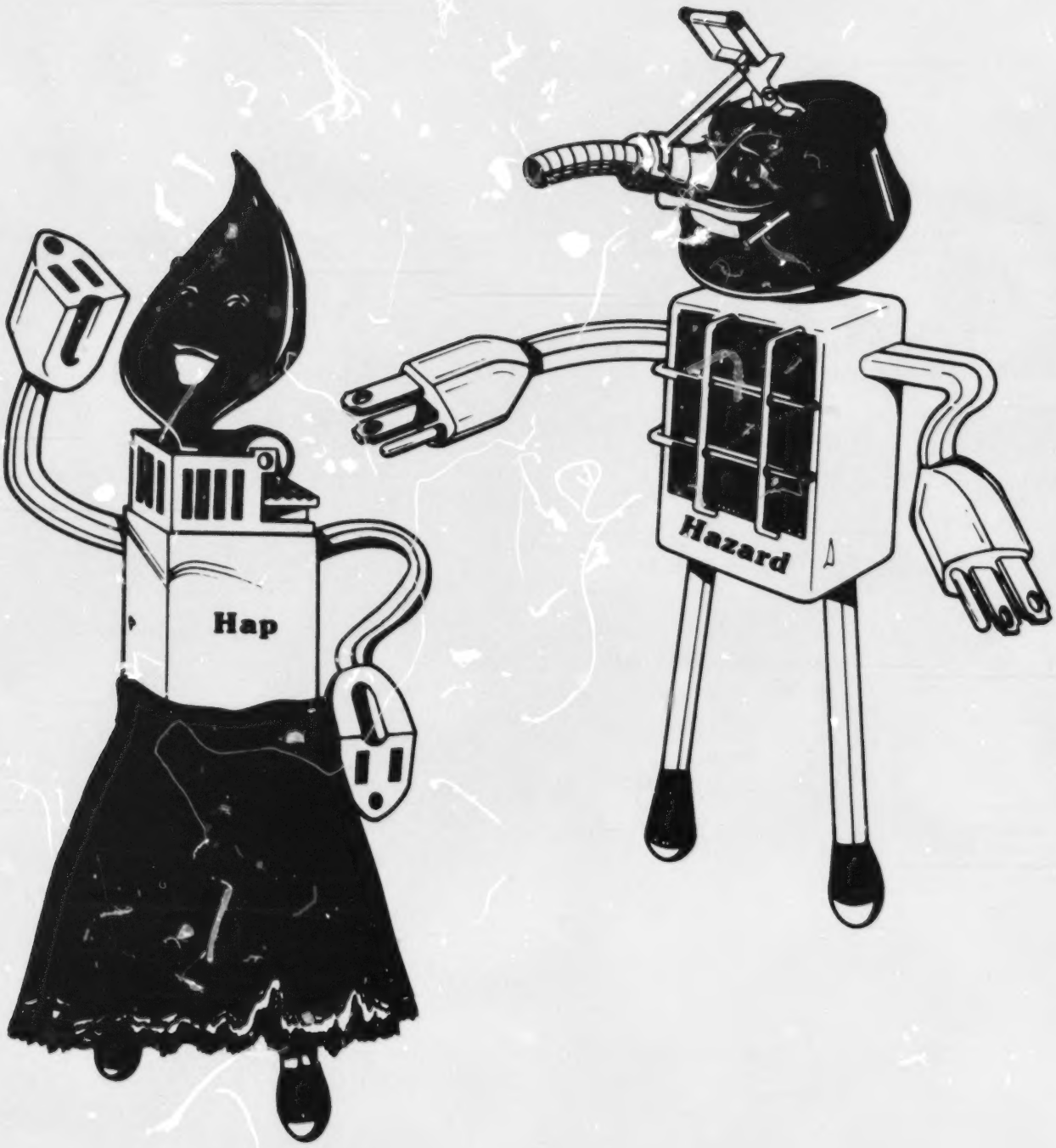


Hap and Hazard are U.S. Consumer Product Safety Commission representatives for flammable products and ignition sources. They appear throughout the materials in this series, guiding consumers to information and activities that will help them learn to protect others. . . prevent property damage . . . and lead safer lives.

So when you see Hap and Hazard, think fire safety!

FOREWORD

The U.S. Consumer Product Safety Commission was created by Congress with a goal to reduce substantially the number of injuries associated with consumer products. CPSC works toward this goal, in part, by informing the public about the comparative safety of products, by setting and enforcing safety standards, and by researching the causes and means for preventing death, illness, and injury.

Flammable products and ignition sources are among the major concerns of the Commission. Fire kills thousands of Americans each year and injures countless others. Many of these tragedies occur because people do not know the proper way to live and work with flammable products and sources of ignition.

As a result, CPSC has produced *Fire In Your Life*—a catalog offering you the information many people are lacking. This catalog has facts about typical accident patterns and about the safest way to purchase, use, store, maintain and dispose of flammable products. Use this catalog to evaluate your own behavior—perhaps even change it—and by doing so reduce the likelihood of an accident happening to you or your family.

Fire in Your Life is also a reference book . . . it can be used in formal teaching situations or informally with business and social groups. Teachers and parents can use it to educate themselves not only in fire prevention, but also in the safest procedures to follow in case a fire-related problem should arise. Likewise, the catalog can be used to educate the children.

Units of Federal, state, and local governments . . . manufacturers . . . business and professional people . . . and everyone concerned with consumer service and public information will have a use for this catalog.

If you need resource materials in addition to those you find in the catalog, write to the organizations listed in the Appendix (page 61), Where to Go for More Information.

The U.S. Consumer Product Safety Commission hopes that by using the information and resources provided, you can greatly increase your chances for leading a good, safe life.

CHAPTER 1

Electricity

The World of Electricity

The most famous early experimenter with electricity was Benjamin Franklin—armed with his kite and brass key. It was a dangerous experiment, and while he didn't know it at the time, Ben could easily have received a fatal shock.

Since Franklin's time, we have acquired a great deal of knowledge about electricity. We know what we can do with it—convert it to mechanical power . . . to heat . . . to cold . . . to voice signals . . . and more. We use electricity to light, cool, and heat our homes and offices, to refrigerate our foods, to talk to each other around the world, to communicate with astronauts on the moon, and even to search for life on Mars.

We have developed detailed theories about electrons, and we have found natural laws that enable us to make electricity "behave" for us. In short, with today's technology, we can use electricity to do just about anything we want.

FIRE AND SHOCK

Electricity presents two major hazards—fire and shock. Strangely enough, there is little real excuse for either because today we have ample knowledge about the dangers of electricity . . . and specific ways for avoiding these dangers.

Many accidents and injuries associated with electricity are caused by human factors: lack of information, indifference, overconfidence, or just plain foolhardiness.

Yes, many people deliberately take chances with electricity . . . with the thought in mind that accidents only happen to *other people.*

Some Electrifying Terms

ELECTRICITY: A form of energy that can be used to do work.

VOLTAGE: An electrical *pressure* that causes or directs current to flow . . . like the pressure that causes water to flow in a pipe.

CURRENT: The time rate of *flow* of an electrical charge . . . like the flow of water in a pipe when the spigot is opened.

RESISTANCE: An *opposition* to current . . . like the spigot when it is closed or the friction in the pipe.

CIRCUIT: A continuous *path* through which a current can flow. It may refer to a large network of paths, such as the wiring in a house.

CIRCUIT BREAKER: A *device* designed to open and close a circuit manually and to open a circuit automatically when there is an overload of current.

CHARGE: A basic electrical *quantity* that makes up an electrical current.

AMPERE: The standard *unit of measure* of the flow of electric current.

A Roadblock to Shock

A CONDUCTOR is a substance through which current can easily flow when voltage is present. A copper wire is an example of a good conductor. A substance that is not a good conductor of electricity is called an INSULATOR. Some of the most common insulators are glass, porcelain, rubber, plastics, ceramics, dry wood . . . . and even air. The most important thing to note about insulators is that they can protect us against shock.

How Electricity Heats

Electricity (electrical energy) flowing through a conductor generates a certain amount of heat—whether we want it to or not. We try to keep heat to a minimum by using a conductor of the right size: the greater the current, the larger the conductor should be.

Sometimes we deliberately arrange a circuit to generate heat—an electric iron, an electric oven or range, a toaster, and more. We do this by purposely using conductors that create greater resistance.

The most common materials used to generate heat—because they are conductors that create resistance—are special alloys like nickel and tungsten. (Copper and silver, on the other hand, are better conductors of electricity.)

If you look at an electric light bulb, you see light emitted by a conductor that is so hot it glows white. And you can see the elements in a toaster or electric range glow red as they resist the flow of current.

This is one way in which electrical current can cause a fire: If the circuit is "overloaded"—carrying too much current for the size wire used—the wire will overheat and may start some nearby flammable material smoldering. Another way is by actual sparks that an electrical circuit may throw off when malfunctioning.

From Start to Finish . . . the Electrical Circuit

An electrical circuit starts at an electrical energy *source*. The source produces a voltage (an electrical pressure) that must have contact with a point that can be considered the *zero voltage point*. This point is the ground of the Earth for the electricity sent to your home. A conducting path connects the energy source to your home appliances and other devices that convert electrical energy to different forms of energy . . . like a toaster converts electrical energy to heat energy. Electrical energy will flow in a complete electrical circuit when home appliances or devices and the electrical energy source have contact with the same zero voltage point.

Electric current will stop flowing in the circuit if its path is broken at any point in the circuit. A disconnecting *switch* in the electrical circuit provides this break: When it is open, or in the "off" position, an *air gap* is formed in the circuit . . . and since air is an *insulator*, the electrical current cannot complete its path.

CONSUMER CUES

Dear Cue:

I've often heard people speak of an "overloaded" circuit. I know a circuit is a path for electricity, but how can it get "overloaded?"

Sincerely,
"Underloaded" on Electricity

Dear Underloaded:

Every circuit has an amount of current that it will carry safely without overheating. For example, most household circuits are designed to carry 15 amperes. (An ampere is a unit of measure of an electric current.) If you connect lights, appliances, and other devices totaling more than 15 amperes, you overload the circuit.

In practice, every circuit has a fuse or circuit breaker acting as a switch to automatically open the circuit if the current exceeds 15 amperes for an unsafe period of time. This is a basic safety device in electrical circuits. But fuses and circuit breakers cannot provide for all situations. Unwise acts can still cause fires. Suppose that your electric iron cord does not quite reach the receptacle, and you decide to use an extension cord. If you happen to use an improper extension cord, it can readily overheat and possibly cause a fire because the cord becomes overloaded, even though the circuit itself does not.

Helpfully yours,
Cue

Dear Cue:

I've done some reading on electricity, and I've gathered from it that a "short circuit" is something undesirable ... perhaps even dangerous. Is this true?

Signed,
An Eager Learner

Dear Eager:

Yes, short circuits can be dangerous. In a short circuit, electrical current takes a different path than its normal path—one that usually gives much less resistance. The new path allows unusually excessive current to flow in the circuit. The portion of the circuit that was bypassed by the current—or shorted out—receives little or none of the current it normally would receive. For example, if an appliance develops a "short" within it, the "shorted" part will receive little or no current while other parts of the appliance and the remaining electrical circuit are able to receive too much current. This causes an overloaded circuit that can produce severe overheating or sparks and create a serious fire and shock hazard.

As always,
Cue

Dear Cue:

I'm in the tenth grade, and I'm doing a science paper on electrical sparks. Can you please verify the following information for me? A spark is simply air particles that have been forced to carry current, causing the particles to become so hot that they give off energy seen as light by the eye.

Thanks a lot,
"A" Student

Dear "A" Student:

Your information can be considered as a simplified explanation of a complex subject. Stay with the books and you will find there is a lot more to the subject than meets the eye—no pun intended. Don't forget one more thing. Sparks, which are also called "arcs" or "arcing," can be a very serious fire hazard.

Yours truly,
Cue

Dear Cue:

What is the real purpose of grounding? Does it have anything to do with the ground?

Respectfully yours,
In Mid Air

Dear In:

When any object is connected to the earth by a path through which electricity can flow, the object is said to be *grounded.* Two wires connect your house to the local power station. One wire brings electricity into your house, and the other wire carries electricity back to the power station. The electric company always connects one of the two wires to the ground, the earth, at the utility pole outside your house. You can be grounded too—by standing on the earth ... or by touching something that is electrically connected to the earth. When you are grounded and touch an electric wire, your body completes an electric circuit. This allows electricity to flow through you, and you get shocked. Some products have three-pronged plugs to prevent you from being shocked. Plugs like these have three wires in the cord—one to bring electricity into the product, one to carry electricity out of the product, and one to connect the product to the ground. If anything goes wrong inside the product while you are using it, a lot of electricity will flow through this ground wire, and the fuse will blow. This breaks the complete circuit and protects you from getting shocked.

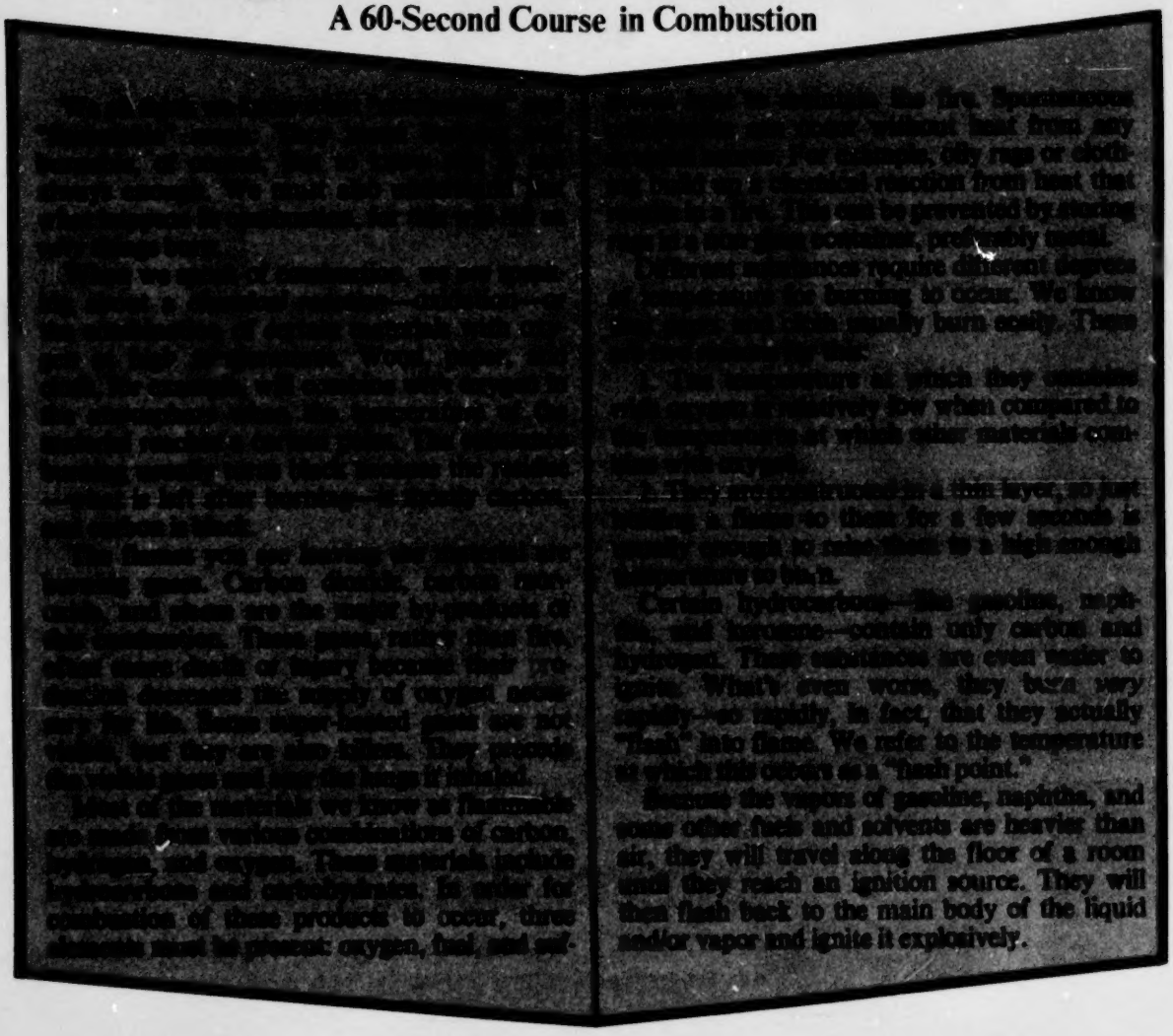
Sincerely,
Cue

If you need information on flammable products and ignition sources, write to: Consumer Cues, Bureau of Information and Education, U.S. Consumer Product Safety Commission, Washington, D.C. 20207. Or call toll free: (800) 638-2666; Maryland only, (800) 492-2937.

CHAPTER 2

COMBUSTION & EXPLOSIVE MIXTURES

A 60-Second Course in Combustion



Explosive Mixtures

An explosion takes place when there is extremely rapid combustion—especially if this happens in a confined space. So any substance that is flammable can also be explosive when mixed with air or oxygen in proper proportions. The "ideal" conditions for an explosion occur when any highly flammable substance is mixed with a sufficient amount of air so that the entire substance bursts into flames at the same instant. Under these conditions, the gases generated in the combustion process develop in large quantity . . . at great speed . . . and with a violent result.

Some substances—like gasoline and paint thinners—can satisfy these conditions very easily. Even at normal room temperature, they are constantly evaporating, and given enough time, they can fill a room with their vapor. Striking a match—or even creating a spark near such a substance—can cause an explosion or fire. This ignition does not occur in a *closed* can containing a flammable liquid due to the lack of oxygen.

But it's not only flammable liquids that can explode like this. Dust and even large quantities of flour, mixed with air, can cause the same thing to happen if they are ignited. And so can any other solid, flammable material if it is in the form of a fine powder that hangs suspended in the air like a gas.

Water . . . Nature's Own Fire Extinguisher

Most of us are accustomed to thinking of water as the natural fire extinguisher, and water is effective for a great many fires . . . BUT NOT FOR ALL.

Fire extinction is accomplished by either or both of two ways: (1) by cooling the burning substance to a point below its combustion temperature and (2) by denying the burning substance oxygen. Water does both for many fires . . . BUT NOT FOR ALL.

A gasoline fire, for example, should not be put out with water. Gasoline is lighter than water and will float on top of it and continue to burn. Electrical fires, too, should not be extinguished with water because of the shock hazard involved. Still, both gasoline and electrical fires can be extinguished. So can most others. All you have to know is which fire extinguisher to use . . . and how to use it. The chart on page 7 describes the different types of fire extinguishers commonly available, the kind of fires they are designed to extinguish, and the proper way to use them. Practice with your fire extinguisher in a safe location and be sure to have it recharged, even if only partially used.

KIND OF FIRE

DECIDE THE CLASS OF FIRE YOU ARE FIGHTING. . .

. . . THEN CHECK THE COLUMNS TO THE RIGHT OF THAT CLASS →

APPROVED TYPE OF EXTINGUISHER

MATCH UP PROPER EXTINGUISHER WITH CLASS OF FIRE SHOWN AT LEFT

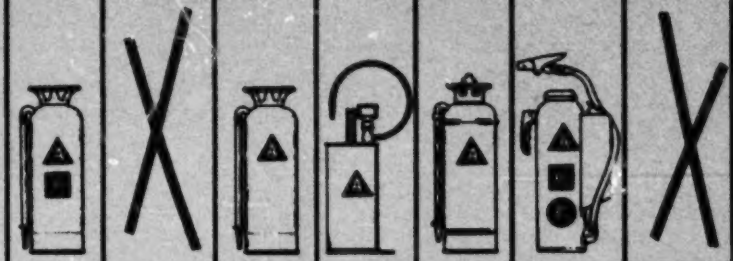
FOAM	CARBON DIOXIDE	SODA ACID	PUMP TANK	GAS CARTRIDGE	MULTI-PURPOSE DRY CHEMICAL	ORDINARY DRY CHEMICAL
Solution of Aluminum Sulphate and Bicarbonate of Soda	Carbon Dioxide Gas Under Pressure	Bicarbonate of Soda Solution and Sulphuric Acid	Plain Water	Water Expelled by Carbon Dioxide Gas		

CLASS A FIRES

USE THESE EXTINGUISHERS →

ORDINARY COMBUSTIBLES
- WOOD
- PAPER
- CLOTH

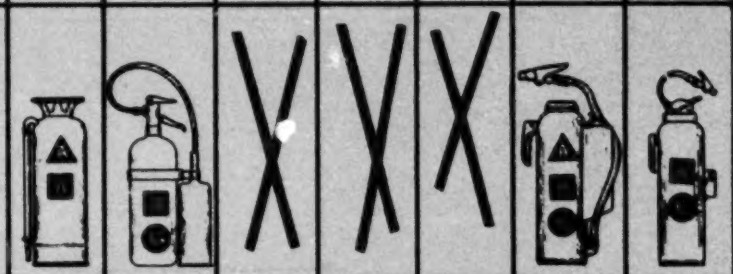
ETC.



CLASS B FIRES

USE THESE EXTINGUISHERS →

FLAMMABLE LIQUIDS, GREASE
- GASOLINE
- PAINTS
- OILS, ETC.

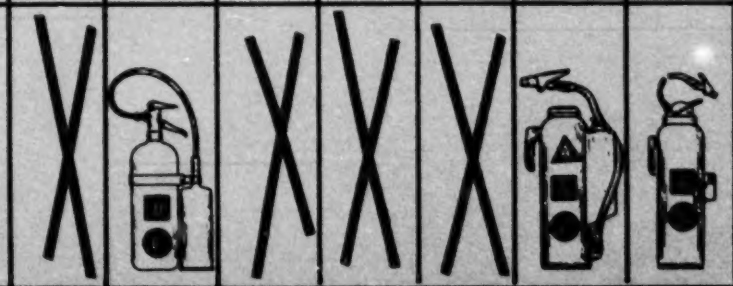


CLASS C FIRES

USE THESE EXTINGUISHERS →

ELECTRICAL EQUIPMENT
- MOTORS
- SWITCHES

ETC.



HOW TO OPERATE

FOAM: Don't Play Stream Into the Burning Liquid. Allow Foam to Fall Lightly on Fire.

CARBON DIOXIDE: Direct Discharge as Close to Fire as Possible. First at Edge of Flames and Gradually Forward and Upward

SODA-ACID, GAS CARTRIDGE: Direct Stream at Base of Flame

PUMP TANK: Place Foot on Footrest and Direct Stream at Base of Flames

DRY CHEMICAL: Direct at the Base of the Flames. In the Case of Class A Fires, Follow Up by Directing the Dry Chemicals at Remaining Material That is Burning

CHAPTER 3

MATCHES

Historical Highlight

Though man has used fire for thousands of years, it was not until recently that he developed the match.

Chemical fire-making devices were the forerunners of the first real matches. The Phosphoric Candle, or Ethereal Match, invented in 1781, was one of the first. It consisted of a sealed glass tube containing a phosphorous-tipped paper. When the tube was broken, air rushed in and ignited the phosphorous.

One of the first matches as we know them was invented in 1827. It was a wooden splint, soaked in molten sulphur, tipped with potassium chlorate and antimony sulfide. The match ignited when it was drawn through folded paper coated with an abrasive powder. This type of match was difficult to ignite and unstable.

Strike-anywhere matches appeared in 1830 when white (yellow) phosphorous was substituted for antimony sulfide. Much easier to ignite and more stable, their principal defects were (1) the toxic fumes of white phosphorous (which, for example, caused bone degeneration in match factory workers) and (2) the tendency of the matches to ignite spontaneously in hot, humid weather.

The safety match was invented in Sweden in 1855. Recently discovered non-toxic red phosphorous was substituted for white phosphorous and was used in the striking surface. Potassium chlorate, the other principal ingredient, was used on the match head.

White phosphorous continued to be used in strike-anywhere matches until it was replaced by non-toxic phosphorous sesquisulfide in 1898. By 1912, white phosphorous matches were banned in most of Europe and, at about the same time, fell out of use in the United States. Today, matches such as these may not be manufactured in or imported into this country. In 1892, paper book matches were invented in the United States, and the 20th century has brought only minor refinements.

MATCH THE MATCH

TYPE	*DESCRIPTION*
SAFETY Match	A match that has the ingredients required for ignition divided between the match head and the striking surface.
STRIKE-ANYWHERE or FRICTION Match	A match that has all of the ignition ingredients in the match head. It is ignited by striking it on any surface where friction is created.
WOODEN SAFETY or STRIKE-ON-BOX Match	A type of safety match that consists of an ignition head on a wooden splint. The splint is dipped in paraffin wax which acts to transfer the flame from the match head to the splint. All matches made in this country are treated with an inhibiting agent. This match is commonly made in a small pocket size or a larger kitchen size.
DOUBLE-DIP or "BIRD'S EYE" Match	A wooden strike-anywhere match with the head *tipped* with a very sensitive striking material. Safer than earlier strike-anywhere matches with heads made entirely of the striking material.
BOOK Match	A safety match usually made with cardboard splints. The splints are joined at the base and stapled to a stiff paper cover.
FIREPLACE Match	May be safety or strike-anywhere matches. The splints are longer, so they are convenient for awkward or dangerous situations like lighting a fireplace.

DO buy match books that have a striking surface on the back cover.

DO close the cover of the match book or box *before* you strike a match.

DO keep only one match book in the same pocket at any one time.

DO remind elderly family members and friends to use matches with caution.

DO choose safety matches rather than old-fashioned "strike-anywhere" matches that will light when struck against any surface.

DO store matches out of the reach of young children.

DO teach older children about the dangers of mishandling matches.

DO strike a match away from the direction of the body.

DON'T let young children play or experiment with matches.

DON'T hold the match any closer than an arm's length when you're striking it.

DON'T buy or pick up match books with colorful covers that will attract young children.

DON'T use matches when something else—like driving an automobile—is distracting you.

DON'T light candles or cigarettes when you might fall asleep and leave them burning.

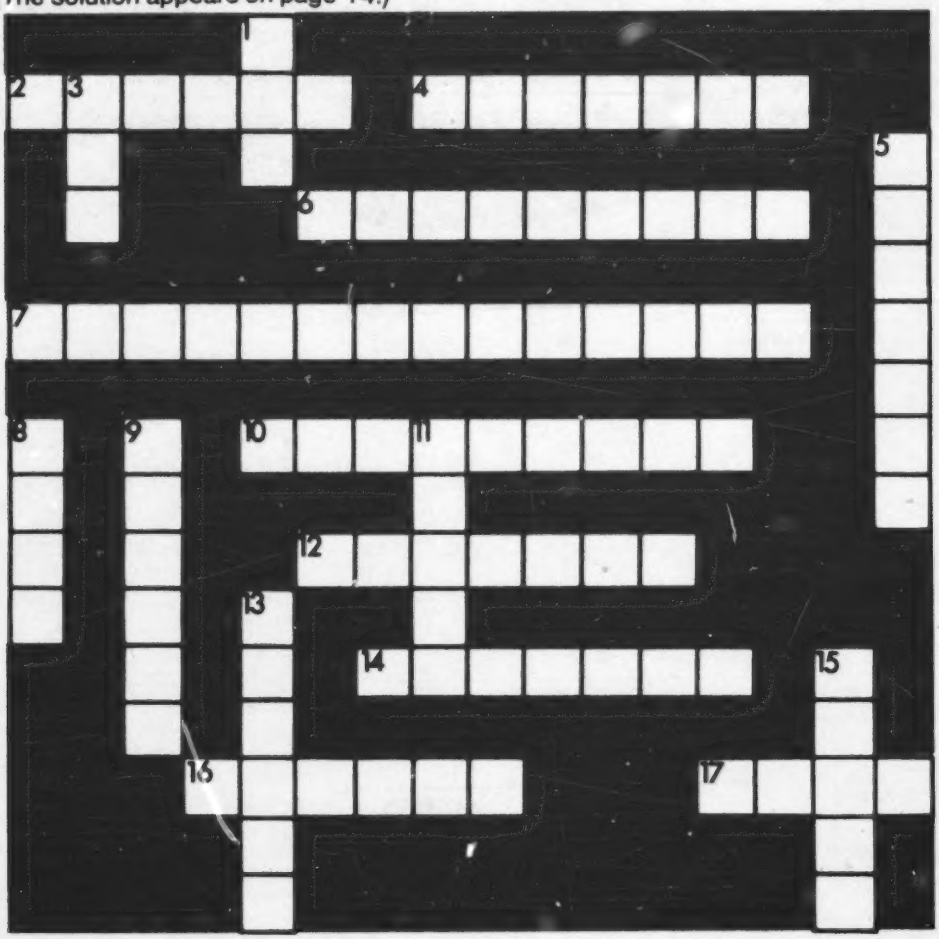
DON'T use matches around flammable liquids—especially gasoline.

DON'T use a waste basket for an ash tray.

DON'T throw a match away until the flame is extinguished and cool to the touch.

MATCH CROSSWORD

DIRECTIONS: Select the correct words from the list below to fill in the blanks. Then complete the crossword. (The solution appears on page 14.)



ACROSS

2. Make sure a match has _____ before you throw it away.
4. Don't use matches near _____ that are flammable.
6. Pay close _____ when you are striking a match.
7. "_____" matches will light when struck on almost any surface.
10. Never light matches where _____ liquids are being used or stored.
12. Keep _____ out of the reach of young children.
14. _____ family members and friends should be reminded about match safety.
16. Colorful _____ on match books will attract young children.
17. Strike a match _____ from your body.

DOWN

1. Play it safe. Don't use matches while you're lying in _____.

WORD CHOICES

ATTENTION	ELDERLY	GLASS
AWAY	FLAMMABLE	CHAIR
ASHTRAY	AFTER	PAPERS
BED	CHILDREN	RAGS
BEFORE	LIQUIDS	STRIKE ANYWHERE
WATER	MATCHES	TEACH
COVERS	METAL	THREE
COOLED	ONE	FABRIC

3. You should never carry more than _____ matchbook in your pocket at any one time.
5. A wastebasket is no substitute for an _____.
8-9. Do not strike matches near oily _____ and _____.
11. Store matches in a closed _____ container.
13. Close the cover of a matchbook or box _____ you strike a match.
15. Parents should _____ older children how to use matches safely.

Rowhouse Fire Kills 4-Year-Old Child*

While his mother stood by watching, unable to help, a four-year-old Washington boy burned to death yesterday in a fire he had started himself, apparently while playing with matches in a bedroom closet.

Summoned by her two young nephews, Isabelle Johnson said she ran to the second floor of the brick rowhouse at 2353 Burchfield Ave., NE, in hopes of saving her only child, Robert. She found the closet engulfed in flames and heard her child calling out to her for help.

The fire department, summoned by Mrs. Johnson's brother, arrived within three minutes. It was too late to save Robert.

Mrs. Johnson stood outside the home, looking stunned. "I saw the closet all on fire . . . he was calling me. I tried and tried to get him out, and I couldn't reach him, I couldn't reach him," she said.

Fire Inspector James L. Molloy said the two nephews had been playing with Robert and probably feared to tell anyone about the fire until it was too late. "When we received the call at 3:08 (p.m.) yesterday, we immediately dispatched an extra rescue squad because we were afraid other children might be trapped inside," he said.

"Little children playing with matches often hide, or don't tell their parents about a fire, figuring 'out of sight, out of mind.' "

According to the D.C. Fire Department, 52 persons, mostly children, died in fires started by careless use of matches during the year from July 1973 through June 1974. A total of 536 fires were started by careless use of matches, leading to 70 cases of serious smoke inhalation, 138 persons burned, and 20 other persons injured in jumps or falls from buildings.

"About 30 or 40 percent of fire fatalities in the city begin with kids playing with matches or candles," said Molloy.

Mrs. Johnson was downstairs in the living room, she said, watching television with her sister. She heard the boys playing upstairs, and about 10 minutes later the two boys came running to report the fire.

It took firemen only two minutes to extinguish the flames.

Mrs. Johnson was ushered into the adjoining house, crying and wrapped in the arms of her sister, Mary. While she was there, firemen carried out the charred body of her son in a blue canvas bag.

When that was done, Mrs. Johnson's family let her go outside again. She huddled on the porch, watching firemen throw charred debris from a second-floor window to the front lawn.

"Where's my boy? Is he gone?" Mrs. Johnson asked.

Nobody answered her.

---

*This is a true story based on a 1974 report in a Washington, D.C. newspaper. Names, the address, and certain other details have been changed.

Detect a Note of Smoke Detector Sense...

Smoke detectors **SENSE** fire only a few minutes after it ignites. . . and **WARN** you several minutes before smoke becomes deadly.

Smoke detectors provide an early warning that could enable you and your family to **ESCAPE** and **REDUCE** the **LOSS** of your property.

Two types of smoke detectors are available:

—**IONIZATION CHAMBER DETECTORS...** sense flaming fires quicker than photoelectric detectors.

—**PHOTOELECTRIC DETECTORS**. . .sense smoldering fires quicker than ionization chamber detectors.

Whichever type you choose—**BUY** a smoke detector . . . or TWO!

Whatever you do—**PLACE** smoke detectors: near or on the ceiling . . . at the tops of stairs. . . in places where smoke is likely to pass as it rises . . .

AND

outside your bedroom doors. (The most important warning you need is when you are asleep.)

Did You Know That . . .

- **Matches that have been extinguished—but not cooled—can cause fires if they come into contact with something flammable.**
- **The striker strip is safest when it is on the back of a book of matches.**
- **Ignition compounds are sometimes applied unevenly to the head of a match, causing it to break apart and spit dangerous sparks when lit.**
- **Matchbooks should be designed with covers that enclose the matches and staples that won't interfere with the striking.**

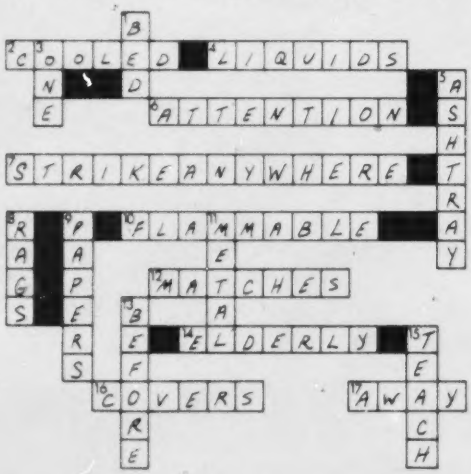
CURIOSITY KILLS!

Curiosity killed the cat, and it can kill your children too. Don't let children play or experiment with matches. Teach children how to handle matches safely. Let them follow your safe example.

****STRIKE . . . BLOW . . . CHECK****

1. STRIKE a match away from yourself with the cover or box closed.
2. BLOW the match out as soon as you finish using it.
3. CHECK the match to make sure it isn't smoldering when you throw it away.

Answers to Match Crossword



CHAPTER 4

SPACE HEATERS

Historical Highlight

The first "space heater" was a fire that heated a cave. After a few centuries this evolved into the fireplace. Fireplaces have ranged from tiny ones, built to provide heat to small enclosures, up to gigantic structures that could roast a whole ox for a medieval castle banquet.

In addition to fireplaces, ancient peoples used lamps and candles for heat as well as light. In some cases these lamps were simply clay or stone vessels holding animal or vegetable oil and a wick.

Both fireplaces and lamps, however, were inefficient for warming anything but the smallest spaces. This led to the development of heating stoves.

Benjamin Franklin improved the stove in 1744 (the well-known "Franklin stove"); the first round cast-iron stoves with grates were made in Philadelphia in 1800 by Isaac Orr. Small iron stoves have become more and more popular as a result of the energy shortage of the 1970's.

Before the early 20th century, small portable room heaters were rare or nonexistent. The first ones, emerging around the 1920's and 1930's, were gas burners or electric heating coils that gave off heat produced by their resistance to the electric current. Most small heaters came into use after the mid-1940's, when the end of World War Two permitted appliance manufacturers to turn their production lines back to peacetime work.

Most of today's small room heaters use either gas, oil, or electricity. Some electric heaters are built as combination heater-and-fan; switching on the heater turns the fan to a slower speed to blow heated air to other parts of the room.

Unfortunately, the wide use of heaters involves safety problems, too . . . for each year, a great many persons must receive hospital emergency room treatment for injuries associated with oil, gas, kerosene, or electric space heaters, or wood or coal burning heating stoves.

Hap and Hazard Shop for Space Heaters

HAZARD: Well, Hap, now that winter's almost here, we'd better start thinking of a way to keep warm. How about a space heater?

HAP: Great . . . as long as it's small. We have to keep about three feet of clearance on all sides of the heater, and in our cramped quarters, that doesn't leave us too much leeway.

HAZARD: What about this one? It's small.

HAP: Small, but dangerous. There's no guard around that heater, and we could easily come into contact with open flames. I want to keep warm, but not that warm!!

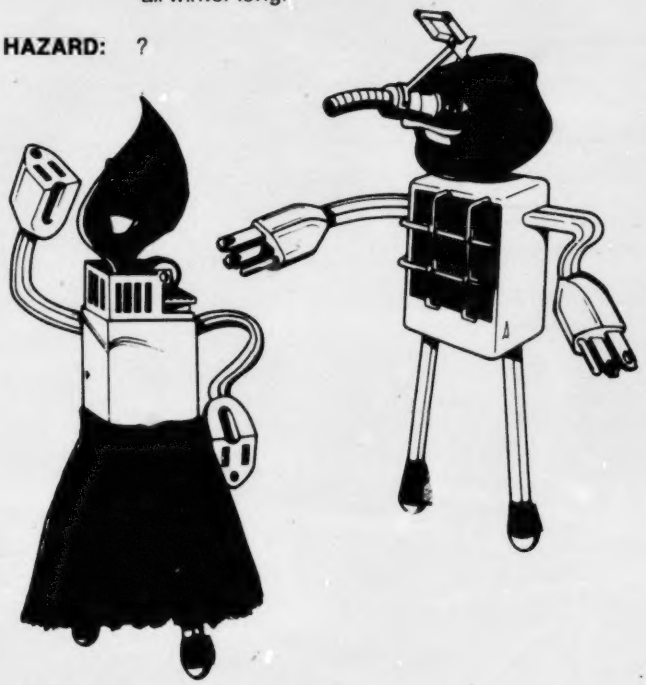
HAZARD: Here's a nice model. It's used. It's cheap. And the tag says it's just been overhauled.

HAP: What the tag doesn't say is that it's unvented. But I can see that for myself. If a heater's unvented deadly carbon monoxide fumes can fill a room pretty fast.

HAZARD: O.K. then, what about this electric model? It even has an automatic switch that cuts the power off if the heater is accidentally tipped over.

HAP: Looks great! But now that I think about it, what do we need a space heater for anyway? We already have one. We can just use that heater in your belly and keep warm all winter long.

HAZARD: ?



A SPACE HEATER FOR EVERYONE

TYPE	DESCRIPTION	POTENTIAL HAZARD
KEROSENE	Unvented or vented through stove pipe or chimney Open flames possible Still popular in rural areas	Fire Clothing ignition Flash fire Poisonous fumes Explosion Hot surfaces
GAS-FIRED	Some give off red glow Direct heating or gas flames directed to porcelain device that radiates and stores heat Can be vented or unvented	Fire Poisonous fumes Explosion Clothing ignition Hot surfaces
ELECTRIC	Rectangular Long narrow coils give off heat Often contains fan Automatic, thermostatic, and/or fan controls	Shock Fire Clothing ignition Hot surfaces
SOLID FUEL BURNING	Free standing Burns wood, coal, other solid fuels Fireplace most common example	Fire Smoke Clothing ignition Poisonous fumes Hot surfaces

Smoke Can "Hurt"

Practice home exit drills . . . if possible, have a door and window or two doors available in every room for escape.

Install an automatic smoke detector in the hall near bedrooms and keep doors open. If you sleep with bedroom door closed, have a detector placed inside the bedroom.

Don't open a hot door. Feel the door and doorknob to determine if heat is nearby.

If door is not hot, brace yourself against the door and open cautiously. If smoke shoots in, force the door closed and escape through a window.

If you must get through smoke . . . crawl. Smoke usually rises, so stay as close to the floor as you can . . . This method could save your life.

CONSUMER CUES

Dear Cue:

Recently, a friend of mine had a dreadful accident with a space heater. For some reason, it exploded while he was trying to light it. Well, I'm sure I don't have to tell you the rest. It was a disaster. My problem is this: Because of the high cost of heating our eight-room house, my husband has decided to keep the furnace turned off and a space heater turned on in whatever room we happen to be using. I'm terrified to turn it on. What can I do to avoid a repeat performance of my friend's disaster?

Signed,
Cold, Scared, & Turned Off

Dear Cold, Scared, etc.:

Calm down! While space heaters can be dangerously explosive, they don't have to be. It sounds like your friend's heater was a gas model. The explosion was probably caused by accumulated gas coming into contact with a lit match. Even if yours is the same type of device, this doesn't have to happen to you. Here are some simple precautions you can take to minimize the danger of lighting your heater. Never turn on the gas until you have a lit match ready and waiting. If the heater doesn't light after the first try, wait awhile before trying again. This will give any accumulated gas enough time to disappear. And if you smell gas coming from the heater, turn the heater off, open a window, air out the room, and wait until all signs of gas are gone before you try relighting it. These simple steps—along with regular inspections—should keep your space heater "explosion-free."

Sincerely,
Cue

Dear Cue:

Why is it that all of a sudden, so many people are up in arms over space heaters? It's ridiculous. I've been using them for years, and I've never had a mishap. Neither have my parents, my parents' parents, my parents' parents' parents, and so on. Kindly respond.

As always,
Skeptical

Dear Skeptical:

To answer your question, people are, as you put it, "up in arms" over space heaters because (1) they can be extremely dangerous; (2) they're being used today with increased frequency; and (3) most people aren't anxious to become a "statistic." Accidents associated with space heaters are happening all the time, and these accidents are occurring with all types of heaters—oil, gas, kerosene, electric . . . not to mention wood and coal burning heating stoves. So, there is a hazard!! Congratulations for the success of your ancestors. Apparently, someone, somewhere in your family tree knew about the proper handling of space heaters. Otherwise, you might not have been so lucky. The problem is, not everyone is as well-informed as your clan.

Best wishes to you & yours,
Cue

Dear Cue:

I know a lot of accidents happen with space heaters. What I don't know is how and why. Can you tell me?

Yours truly,
A Curious Mind

Dear A.C.M.:

Various types of accidents are associated with space heaters. Some occur when an article of clothing or a part of the body comes into contact with the flame, the heating element, or the hot surface area of a heater. Another frequent cause of accidents is carbon monoxide poisoning. This deadly gas can be emitted from unvented space heaters and from those that are poorly adjusted or dirty. Explosions, too, are known to happen around space heaters. If you allow gas to accumulate in the device, the gas can explode when you try to light it. Using flammable liquids in a space heater—and even storing them in the same room—can also cause an explosion since flammable vapors can travel and ignite. An added source of trouble is electrical shock. This happens to people who try to adjust the controls of their electric heater while wet, while they are holding something wet, or while they are standing in water. All of these situations can and do arise—with all too much frequency. You can avoid them by learning the proper procedures for selecting, using, and caring for all types of space heaters.

Regards,
Cue

If you need information regarding flammable products and ignition sources, write to: Consumer Cues, Bureau of Information and Education, U.S. Consumer Product Safety Commission, Washington, D.C. 20207. Or call, toll-free: (800) 638-2666. Maryland callers only, call: (800) 492-2937.

What is Your "FLAME-ABILITY QUOTIENT" for Space Heaters?

Are you using and maintaining your space heater in the safest way possible? Answer the following questions—yes or no—and calculate your FAQ . . . your ability to prevent unwanted fire, burns, or shock. (Scoring information appears below the last question.)

	Yes	No
1. If you must use an unvented space heater, do you keep a window or door at least partially open?	○	○
2. Do you light the match before you turn the gas heater on?	○	○
3. Have you taught your children about the danger of playing near space heaters?	○	○
4. Have you ever used charcoal in a heating stove?	○	○
5. Is your space heater inspected, cleaned, and adjusted regularly?	○	○
6. Do you use an electric space heater near water sources—such as in the bathroom or kitchen?	○	○
7. Is there at least three feet of clearance between your heater and any flammables in the room (drapes, furniture, magazines, etc.)?	○	○
8. Have you placed your space heater in a frequently used traffic lane?	○	○
9. Do you know the proper fuel to use in your heating device?	○	○
10. Have you ever substituted fuels for convenience (coal in a wood burning stove, oil in a kerosene heater, etc.)?	○	○
11. Do you keep the damper open while fuel is burning in your space heater?	○	○
12. Are there loose or missing guards on your space heater?	○	○
13. Do you wait until all ashes are cooled before you dispose of them?	○	○
14. Have you ever fallen asleep with an unvented heater operating?	○	○
15. Do you use or store flammable liquids near the heater?	○	○
16. Have you ever filled a warm space heater with cold oil?	○	○
17. If your heating device has open flame, is there a metal screen around it?	○	○
18. Is your space heater serviced every year?	○	○
19. Does your electric heater have a thermostat control and an automatic shut-off device?	○	○
20. Did you ever have an accident that was associated with a space heater?	○	○

Answers—You should have answered "yes" to questions 1, 2, 3, 5, 7, 9, 11, 13, 17, 18, and 19. For the remaining questions, the safest answer should have been "no." Tally up your score, giving yourself 10 points for each correct answer.

Evaluating Your FAQ:

200 points—Congratulations! Keep warm and happy. You're a real winner.

160-190 points—You're doing pretty well. Find out your weak spots and clear them up.

120-150 points—Be prepared for some trouble tomorrow unless you make some important changes today.

Below 120 points—Change your habits or install central heating. There are some cold winters ahead!

CHAPTER 5

Extension & Replacement Cords

Historical Highlight

Extension and replacement cords have been used almost as long as electric appliances have. But, like appliances, they have changed a good deal over the years.

The first electric appliances appeared before 1900. These were irons, coffee makers, and toasters. The extension cord—which evidently has no specific "invention" date—came into use close to the turn of the century. Such cords were used by 1915 in their early form, with little or no diversity.

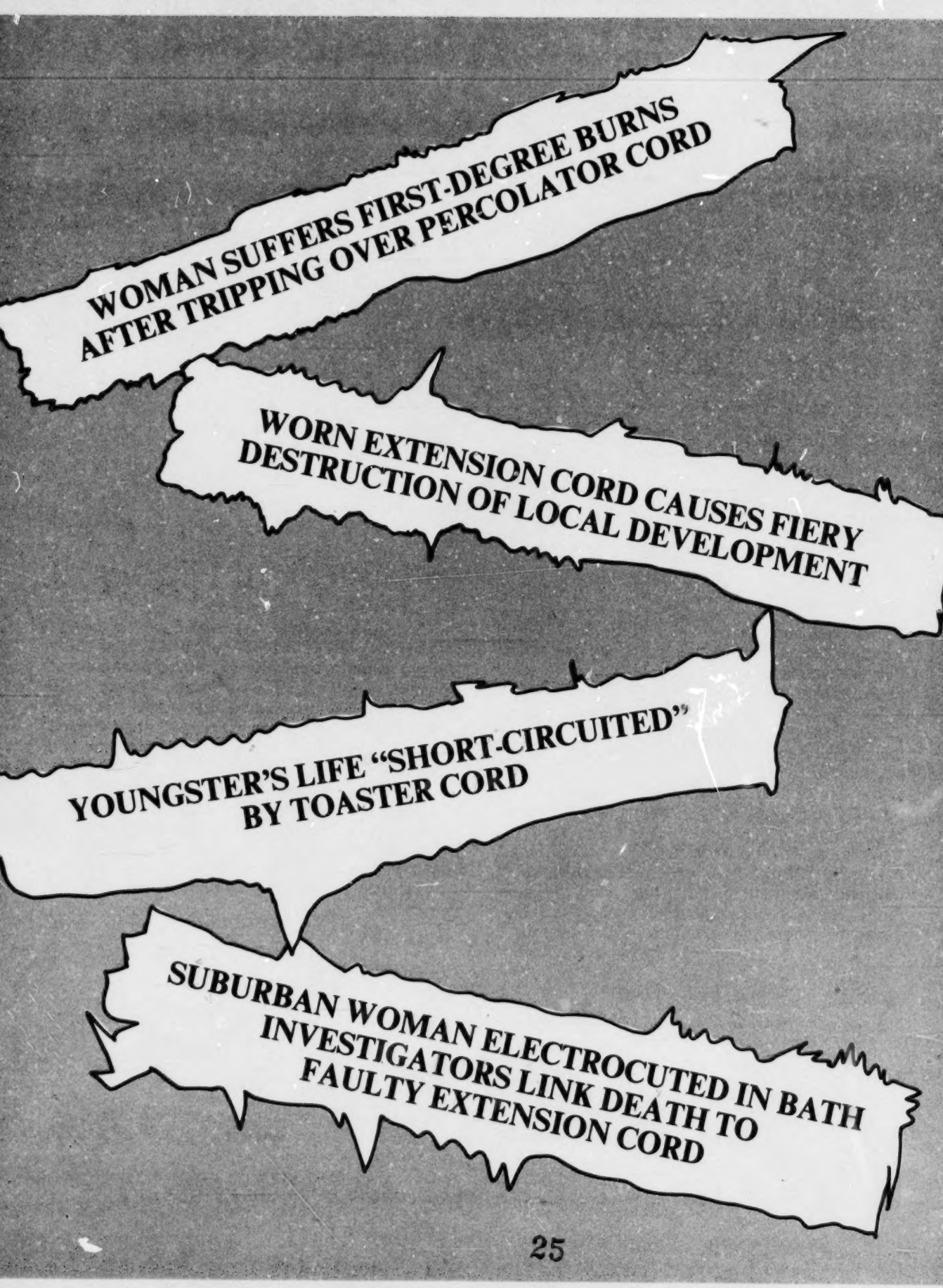
While electric appliances became more plentiful during the 1920's, there were still relatively few in existence when compared to the variety available today. There were refrigerators, clothes washers, vacuum cleaners, toasters, fans, clocks, and more.

The appliance industry nearly came to a dead stop during the 1940-45 period. Manufacturers turned almost completely to making materials for the military. But when the war ended, the appliance industry mushroomed, and many new products came into the market. As the use of these electric appliances grew, so did the use of extension and replacement cords.

Today you can walk into a hardware store and buy cords made for specific appliances or types of appliances, as well as for more general purposes. And while extension and replacement cords often make life easier for most users, when used improperly they carry a hidden cost in terms of injury and death.

Kids & Cords Don't Mix

Most victims of electric cord accidents are children between the ages of 6 months and 4 years. A chief cause for these injuries is that water, saliva, and even wet diapers "don't mix" with electricity. Small children often suck and bite on cords, tug at them with their hands and mouths, trip over them, and play with them. The result has been serious and needless injury, disfigurement, and in many cases, death. So if you have small children, remember this—**an extension cord should only be used when it's absolutely necessary.**


WOMAN SUFFERS FIRST-DEGREE BURNS
AFTER TRIPPING OVER PERCOLATOR CORD
WORN EXTENSION CORD CAUSES FIERY
DESTRUCTION OF LOCAL DEVELOPMENT
YOUNGSTER'S LIFE "SHORT-CIRCUITED"
BY TOASTER CORD
SUBURBAN WOMAN ELECTROCUTED IN BATH
INVESTIGATORS LINK DEATH TO
FAULTY EXTENSION CORD

Electrical appliances and tools usually have small metal plates or stickers that provide their electrical ratings. Here's how to read and understand them:

Voltage rating: This may be given as "105-120" volts alternating current (or "VAC"). House voltage is normally 120 volts.

Frequency: The tag may also say "60 cycle," "60 hertz," or "60 hz." This is a frequency rating, of no great concern to you unless you are using the appliance somewhere where you do not have the standard American household electrical supply voltage.

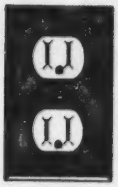
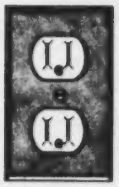
Current rating: The tag may identify the current rating—i.e., the current "drawn" through the cord/circuit by the device—and this may be given as: 1.2 amp (or ampere or a), if the device draws more than one ampere. If it draws less than one ampere, it may be given as a decimal quantity (i.e., 9 amp) or it may be given in thousandths of an ampere (750 milliamperes or 750 ma).

Wattage rating: Frequently, especially in the case of heating appliances, power ratings are given as so many watts—1200 w, 1150 w, etc. You can gauge the approximate current easily from this simple arithmetic: Divide the wattage figure by the voltage rating. A 1200-watt device with a 120 voltage rating draws approximately 10 amperes. (Sometimes there is a wattage rating *instead* of a current rating.)

On the other hand, if you have only the current rating, and you want to know the approximate wattage rating, simply multiply the current rating—in amperes—by the house voltage, which is normally 120 volts. Thus, a device drawing 1.2 amperes is rated at approximately 144 watts.

Check the Label and See . . .

A Word to the Wise

- Never overload a wall 
- A  , properly wired, is safer than a
- An must match the size and type of cord that comes with an appliance. (electric rating)
- Check an for signs of wear.
- To prevent wear, never place an under a
  in a , or over
- If an appliance is exposed to or other moisture, the
  must have proof insulation.
- Cool an
  before wrapping an around it.
- Don't put on an electrical
  until the current has been turned off. You could be electrocuted.

What is Your "FLAME-ABILITY QUOTIENT" for Extension and Replacement Cords?

Are you using and maintaining your electrical cords in the safest way possible? Answer the following questions—yes or no—and calculate your FAQ—your ability to prevent unwanted fire, burns, or shock. (Scoring information appears below the last question.)

	Yes	No
1. Do you regularly inspect extension and appliance cords for fraying, exposed wires, or loose plugs?	○	○
2. Do you have any wall outlets in your house that are not in use and not covered by safety caps?	○	○
3. Are all unused extension cord receptacles covered with electrical tape or plastic safety caps?	○	○
4. Do your children ever play with or near cord plugs or wall outlets?	○	○
5. Do your appliance plugs fit securely into the extension cord receptacle?	○	○
6. When you use the extension cord receptacle, are the plug prongs ever exposed?	○	○
7. Do you use the same type (gauge size) of extension cord for both your air conditioner and your radio?	○	○
8. If you are using a grounded appliance (plug will have a rounded third prong), are you plugging it into a properly-grounded three-hole outlet or using a properly-grounded three-hole adapter with a two-hole outlet?	○	○
9. Are any cords in your home placed near radiators or other high heating sources?	○	○
10. Do you ever wrap a cord around an appliance immediately after using it?	○	○
11. Do you have extension cords running under carpets or across traffic areas?	○	○
12. If an appliance is plugged into an extension cord semi-permanently, have you taped the plug in place to prevent children from unplugging it?	○	○
13. Are the cords in your kitchen or bathroom close to water?	○	○
14. Do you use extension cords that have either a single slot or a self-closing outlet to cover unused receptacles?	○	○
15. Is any extension cord in your home longer than it needs to be?	○	○

Answers—You should have answered "yes" to questions 1, 3, 5, 8, 12, and 14. For the remaining questions, the safest answer should have been "no." Tally up your score, giving yourself 10 points for each correct answer.

Evaluating Your FAQ:

150 points—You've mastered the situation. Great work!

120-140 points—Not a bad score, but still room for improvement.

100-110 points—Your FAQ is "shocking" and, chances are, so are your electrical cords.

Below 100 points—Start from scratch, learn the basics, and improve! In the meantime, be careful!

Detect a Note of Smoke Detector Sense . . .

Smoke detectors **SENSE** fire only a few minutes after it ignites . . . and **WARN** you several minutes before smoke becomes deadly.

Smoke detectors provide an early warning that could enable you and your family to **ESCAPE** and **REDUCE** the **LOSS** of your property.

Two types of smoke detectors are available:

—**IONIZATION CHAMBER DETECTORS**. . . sense flaming fires quicker than photoelectric detectors.

—**PHOTOELECTRIC DETECTORS**. . . sense smoldering fires quicker than ionization chamber detectors.

Whichever type you choose—**BUY** a smoke detector . . . or TWO!

Whatever you do—**PLACE** smoke detectors: near or on the ceiling . . . at the tops of stairs . . . in places where smoke is likely to pass as it rises . . .

AND

outside your bedroom doors. (The most important warning you need is when you are asleep.)

CHAPTER 6

FLAMMABLE FABRICS

Historical Highlight

A spinning wheel and a hand loom were in almost every home in Colonial America, but the use of fabrics dates from much earlier. The following are a few of the fibers we use to make fabric today:

Natural Fibers

Linen, made from part of the flax plant, is the oldest textile fiber. It was used in prehistoric times and later, in ancient Egypt. Linen weaving was done in England by around 400 A.D. Today this fiber is used in so many ways around the home that the word "linens" has become synonymous with "household textile goods."

Wool is mentioned as far back as Biblical times. Much later—in the 15th and 16th centuries—sheep from Spain and England were brought to the American colonies. The Spanish explorers who crossed the southern part of what became the United States carried sheep with them from California to Florida.

Cotton, a leading textile fiber, was woven into fabrics by natives in India as early as 1500 B.C. It was introduced to England in 1298 for use as candle wicks. Cotton fabrics were manufactured in central Europe by the 1400's. Eli Whitney invented the "cotton engine" (quickly shortened to "cotton gin") in 1793; this combed seeds out of cotton fibers, removing a major delay in cotton manufacturing and letting cotton become the South's most important crop.

Production of *silk* textiles began in 2640 B.C., legend says, when Chinese Empress Si-Ling-Chi noticed a silkworm spinning its cocoon and wondered how she would look in a gown of such material. Silk weaving was practiced in many countries, but silkworm raising stayed a Chinese industry until, in the 6th century A.D., it spread to the Middle East. The great French scientist Louis Pasteur earned the title "savior of the silk industry" in 1854 when he destroyed worms which had caught a disease that threatened French silk production and introduced sanitary breeding conditions for silkworms. World silk production peaked at 130 million pounds in 1940.

Glass fiber was experimental until the late 19th century. In 1893 the E. D. Libbey Glass Co. made the first spun glass dress, an opaque and rather stiff garment that was exhibited at the World's Columbian Exposition (the "Chicago World's Fair"). The glass textile industry began its real growth only after 1938, when researchers succeeded in producing commercially usable glass fibers.

Man-made fibers

There are a wide variety of these, some created for particular needs and some discovered by chance. Production of man-made fiber was almost totally a U.S. industry until the1950's. Foreign production grew until by 1960 this country made less than half the world's non-cellulose man-made fibers. Some examples of man-made fabrics include rayon, nylon, acrylics, and olefin.

Rayon was invented in 1884 by Count Hilaire de Chardonnet, a former pupil of Pasteur. De Chardonnet was responsible for the first commercial production of man-made cellulose-based fiber in 1891, at Besancon, France. (He dissolved cellulose nitrate in a mixture of alcohol and ether. The strong, attractive fabric was so flammable that it had to be abandoned.) Researchers in England, France, Germany, and the United States worked during the 1890's and early 1900's to produce better "artificial silk." In 1892, two British workers, Charles F. Cross and E.J. Bevan, invented the "viscose method" while trying to make carbon filaments for electric lamps. The first commercial "artificial silk" produc-

tion in the United States took place in 1910 or 1911. The "acetate process" uses acetone and other chemicals to make the liquid that is spun into threads. In 1924 Kenneth Lord suggested renaming the fabric to avoid such terms as "artificial silk" and "milkweed silk." The word "rayon" was created for the material, based on "ray," meaning a beam of light. By 1925 several companies were manufacturing rayon.

Nylon was developed in 1938 from studies of certain chemical compounds. The inventor, chemist Dr. Wallace H. Carothers, thought the new material would be ideal for ladies' stockings. The first name was "norun" because it was thought "runs" or tears in it would not show. When that name had to be changed, tinkering with the letters eventually produced "nylon." Nylon was announced in October 1938, and the first nylon stockings went on sale nationwide in the summer of 1940. They were so enthusiastically received that "nylons" became widely accepted as another word for ladies' stockings.

Polyester fibers were introduced in 1953, when dacron, the first polyester, came on the scene. This particular fiber was immediately accepted for use in easy-care, wash-and-wear garments. By 1959, three new polyester fibers entered the U.S. market—fortrel, vycron, and kodel. These, like dacron, became popular because they were wrinkle resistant, wear resistant, and simple to care for.

Acrylics account for about 20% of the noncellulose man-made fiber market. Since their first appearance in 1948, these fibers have been used in sweaters, fur-like fabrics, and carpets. Because of their durability and easy-care characteristics, acrylic fibers tend to be quite popular among consumers.

Olefin, the newest of the man-made fibers is the lightest fiber made. Olefins are relatively inexpensive to produce for three main reasons: (1) they are easy to make; (2) the raw material they are made from is readily available; and (3) because of their light weight, a pound of olefin will make more fabric than a pound of other fibers. While olefin was first developed in Italy, it is widely used in the U.S. today.

FEDERAL LAWS

Two Federal laws have been passed that enable the Consumer Product Safety Commission to set flammability standards and to inform the public about the hazards associated with flammable fabrics. Standards have been set for the flammability of general wearing apparel, carpets and rugs, mattresses, and children's sleepwear. The Federal laws are summarized below:

Flammable Fabrics Act

- —Passed in 1953 to regulate the manufacture for sale in interstate commerce of all highly-flammable wearing apparel fabrics.
- —Amended in 1967 to cover a wider range of clothing and interior furnishings, with responsibilities divided among the Secretary of Commerce; the Secretary of Health, Education and Welfare; and the Federal Trade Commission.
- —All standards and rules and regulations for recordkeeping and labeling related to these standards codified in the Code of Federal Regulations (CFR) on December 30, 1975.

Consumer Product Safety Act

- —Passed in 1972; created the U.S. Consumer Product Safety Commission with broad jurisdiction over product safety. Transferred responsibilities and functions under the Flammable Fabrics Act to the Commission, effective May 14, 1973.

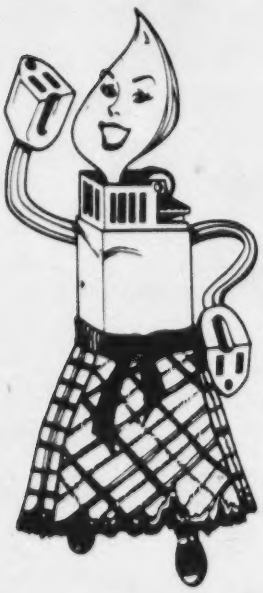
Did You Know That . . .

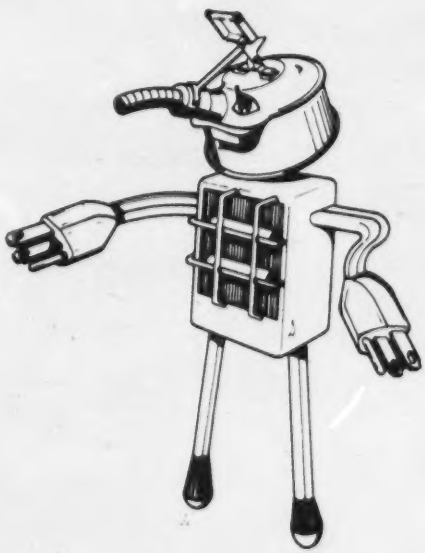
- **Children set their clothing on fire most often while playing with matches or lighters.**

- **If you spill lighter fluid on your clothing and then light a match or lighter, the flame is likely to ignite the vapors of the spilled fluid.**

- **Females are usually engaged in cooking and males are usually burning trash, cleaning with flammable liquids, or working with machinery when their clothing ignites.**

- **Combustion of drapes, beds, upholstered furniture, and other typical household items can generate heavy smoke and gases that can cause death.**





DON'T MIX FABRIC AND FLAME

Keep children from climbing on top of or around ranges by removing all "bait" from the area.

Don't warm yourself by leaning against or turning your back to a range.

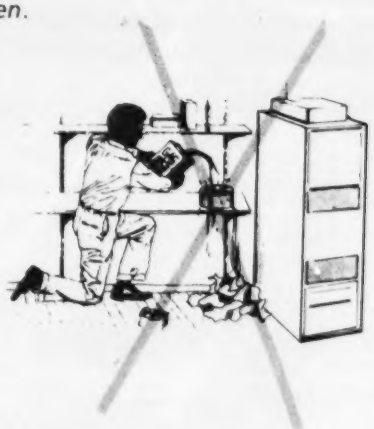
Avoid wearing loose fitting clothing while cooking or working near the hot burners of a range.

Use potholders instead of kitchen towels that hang down loosely.

Avoid smoking in bed.

Upholstered furniture is flammable, so keep smoking materials away.

Keep matches and lighters away from children.



Flammable liquids should not be used in a confined area or near an ignition source.

DO'S and DON'TS for Laundering Flame-Resistant Fabrics

There are many kinds of flame-resistant fabrics. Each fabric and garment is labeled with its own special care instructions because different laundering methods may change their characteristics. Be sure to look for and follow all special care instructions.

HAP AND HAZARD GO TO WASHINGTON

HAZARD: Our trip to Washington, D.C., has taught me that the Federal government is working to see that flammable materials are safely used in the marketplace, Hap.

HAP: I know, Hazard. The Flammable Fabrics Act was the first step. That Act has provided flammability regulations for general wearing apparel, carpets, rugs, mattresses, and children's sleepwear.

HAZARD: Congress created the U.S. Consumer Product Safety Commission which is now responsible for administering the Flammable Fabrics Act.

HAP: I learned about carpets and rugs when we visited CPSC. Large carpets and rugs have to pass flammability tests.

Small rugs (no dimension greater than 6 feet and an area no greater than 24 square feet) that do not meet the standard must have specified labeling on them warning against careless use near ignition sources.

HAZARD: Mattresses and mattress pads have to pass tests too, and if mattress pads are treated with a flame retardant, they must have care labeling so the consumer knows how to maintain the flame-resistance.

HAP: What about clothes, Hazard? I know there are standards for clothing, but aren't there special ones for children's sleepwear?

HAZARD: Yep—through size 14. The standards are tough for kids' pajamas and gowns and robes.

HAP: I feel a lot better just knowing that the government—and industry—are working together to protect us. We don't always know all we should know to protect ourselves!

Test Your Knowledge

Test Your Knowledge is designed to be a learning exercise. For each question, choose the answer or answers that appear to be the best choices offered. Then, be sure to check the answer guide on page 34 very carefully. *That's where the real lesson will be learned.*

1. Which of the following *natural* fibers burns with the least intensity?
   A. Cotton
   B. Linen
   C. Silk
   D. Wool

2. Denim is _____ to ignite than cheesecloth.
   A. More likely
   B. Less likely
   C. No more or less likely

3. Terrycloth is _____ because it is _____.
   A. Safer than most fabrics/heavy
   B. Less safe than some fabrics/filled with air spaces between the yarns
   C. Safe/made of natural fiber
   D. Not safe/often used in the kitchen

4. Flame-resistant fabrics are good choices for draperies _____.
   A. Because these fabrics ignite quickly
   B. Because drapery fabrics are not important
   C. Because these fabrics do not ignite easily
   D. Because these fabrics can be hung while damp

5. When buying furniture, it is _____ to consider the flammability of the upholstery fabric and stuffing.
   A. Not necessary
   B. Always important
   C. Sometimes important
   D. Ridiculous

6. What type of clothing is less likely to ignite?
   A. Loose-fitting clothing with wide long sleeves and pants legs
   B. Lightweight clothing which blows easily
   C. Close-fitting clothing made of lightweight fabric
   D. Close-fitting, tailored clothing made of heavyweight fabric
   E. Flame-resistant fabrics

7. _____ is (are) recommended as sleepwear for children.
   A. Long gowns
   B. Close-fitting flame-resistant sleepwear
   C. Loose-fitting flame-resistant sleepwear
   D. Tight-fitting pajamas

8. Flame-resistant means that fabric _____.
   A. Will not burn
   B. Will burn
   C. Will resist flames better than other fabric and can self-extinguish if removed from the source of flames or sparks
   D. Is less likely to ignite if near a source of flames or sparks

9. Fluffy fabric with a long pile will usually ignite more quickly than the same material with _____.
   A. A short pile
   B. A thick pile
   C. Tassles
   D. A short pile made of flame-resistant material

10. Flame-resistant sleepwear is especially recommended for _____.
    A. Children
    B. Police officers and firemen
    C. Elderly and handicapped persons
    D. Children, elderly, and handicapped persons

11. Should children's Halloween costumes be made from flame-resistant material?
    A. No, because they are worn for only a short time.
    B. It doesn't matter.
    C. Sometimes, if adults are not accompanying children.
    D. Always, because trick-or-treaters often come near open flames, like candles inside pumpkins.

12. What should you do if your clothes catch fire?
    A. Drop to the ground and roll.
    B. Run for water and douse yourself.
    C. Call your local fire station.
    D. Pray.

13. How should fabrics treated for flame-resistance be laundered?
    A. Use no special care.
    B. Always follow label instructions on flame-resistant fabrics and clothing for advice on special care.
    C. Use a lot of soap, bleach, and fabric softener.
    D. Wash in warm water with phosphate detergent.

14. The U.S. Consumer Product Safety Commission is responsible for administering and enforcing flammability standards for_____.
    A. Dish towels, bath towels, and wash cloths
    B. Handmade quilts, afghans, and tablecloths
    C. Clothing, carpets, rugs, mattresses, and children's sleepwear
    D. Books, magazines, and newspapers

15. What precautions should be taken while cooking to prevent clothes catching fire?
    A. Keep a bucket of water handy by the stove.
    B. Tape the number of the local fire station on the refrigerator.
    C. Wear loose fitting clothes with long wide sleeves while using the stovetop or oven.
    D. Wear close-fitting clothes made of smooth and tightly woven fabric when using the stovetop or oven.

Test Your Knowledge—Answers

1. D. Wool burns with the least intensity of these natural fibers.

2. B. Denim is less likely to ignite than cheesecloth because it is heavier and more tightly woven.

3. B. Terrycloth is less safe than some fabrics because it is filled with air spaces between the yarns.

4. C. Flame-resistant fabrics do not ignite easily.

5. B. It is always important to consider the flammability of both furniture upholstery fabric and stuffing.

6. D.& E. Close-fitting, tailored clothing has less chance of igniting or catching nearby flames or sparks. Flame-resistant fabrics offer even more protection. Therefore, to reduce fire hazards, design should be considered as carefully as fabric in buying clothes.

7. B.& C. Flame-resistant sleepwear is required by law for children (0-14 sizes). Close fitting sleepwear is best of all since long gowns and other loose-fitting sleepwear may get in the way of, and be ignited by, ranges, space heaters, and fireplaces.

8. C. Flame-resistant fabrics will resist flames better than other fabrics and can self-extinguish if removed from the source of flames or sparks. Flame-resistant fabric can burn, but it is more difficult to ignite.

9. D. A short pile on flame-resistant material offers more protection than other types of pile. If flame-resistant material is not available, a short pile reduces fire hazard better than a long pile.

10. D. Flame-resistant sleepwear is recommended for children, elderly, and handicapped persons. The aging and handicapped, like children, often are unable to react immediately or correctly to an accident situation.

11. D. Children's Halloween costumes should always be made of flame-resistant material. Halloween costumes are often made of cheap, lightweight material which can create a hazard when children are near an open flame.

12. A. If your clothes catch fire, you should remove them immediately. If this isn't possible, you should drop to the floor and roll in a blanket or rug to kill the flames. Remove the smoldering clothing, put cold water on the burns, then call a doctor right away.

13. B. For best results, always follow label instructions on flame-resistant fabrics. However, if no special care is indicated, you may wash the fabric in warm water—not hot—with phosphate detergent.

14. C. The U.S. Consumer Product Safety Commission (CPSC) has been responsible for setting standards that put the Flammable Fabrics Act to work. The Act, passed by Congress, regulates the manufacture of clothing, carpets, rugs, mattresses, and children's sleepwear.

15. D. Close-fitting clothes made of smooth and tightly-woven fabric reduce chances of brushing against flames and igniting.

FLAMMABLE FABRICS

If your clothing catches fire, remove it as quickly as you can. If this can't be done . . .

DROP down immediately.

ROLL in a blanket or rug to extinguish the flames.

REMOVE smoldering clothing, if not adhering to the skin, and put cold water on the burns.

WRAP in a clean sheet.

CALL a doctor immediately.

Smoke Can "Hurt"

Practice home exist drills . . . if possible, have a door and window, or two doors available in every room for escape.

Install an automatic smoke detector in the hall near bedrooms and keep doors open. If you sleep with the bedroom door closed, have a detector placed inside the bedroom.

Don't open a hot door. Feel the door and doorknob to determine if heat is nearby.

If the door is not hot, brace yourself against the door and open cautiously. If smoke shoots in, force the door closed and escape through a window.

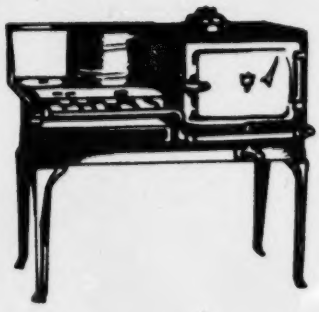
If you must get through smoke . . . crawl. Smoke usually rises, so stay as close to the floor as you can. This method could save your life.

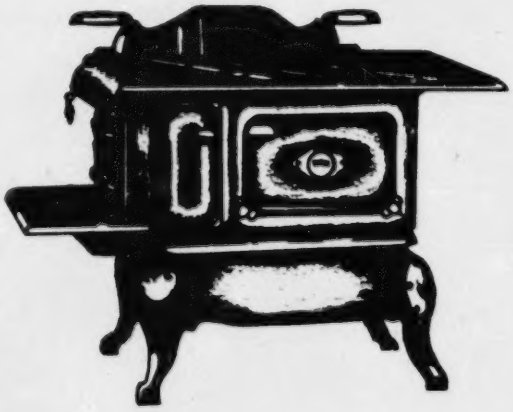
CHAPTER 7

OVENS AND COOKING RANGES

The first stoves appeared in the 15th century, but their crude design kept them from wide popularity as a cooking tool. It wasn't until the early 19th century that new designs began to replace the fireplace for cooking and baking.

The popularization of the round heating stove, which couldn't be used for cooking, prompted the development of the first coal range—a big cast-iron model with cooking plates and an oven for baking.



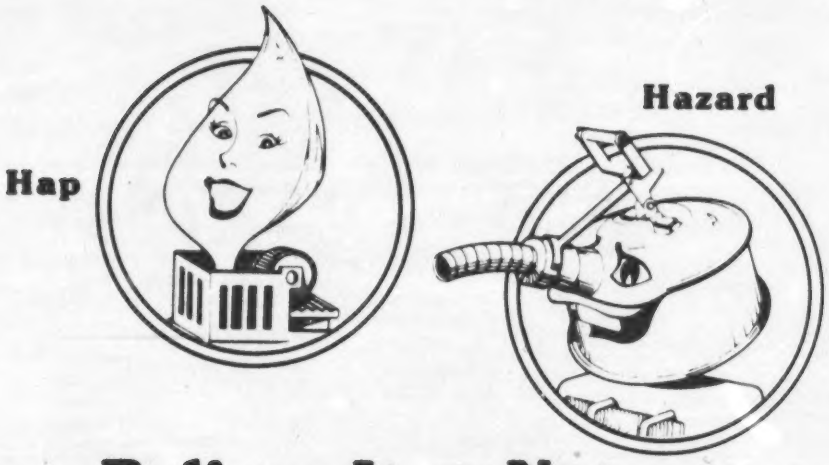


The first oil ranges borrowed the oil lamp design. A wick was covered by a metal plate for holding the pan. Naphtha ranges mixed naphtha vapor and air to produce hot flame. These ranges were later modified to include more burners and larger fuel tanks.

Cooking on gas ranges proved to be quick, clean, and inexpensive. By 1860, gas ranges were in common use. Natural gas, coal gas, or their mixture was fed into a burner ring that had tiny holes, and the burner was ignited when the cook lit the escaping gas with a match.

Today, there are modern conveniences that make gas cooking popular—pilot lights start the range without the use of matches . . . controls provide certain temperatures for certain foods.

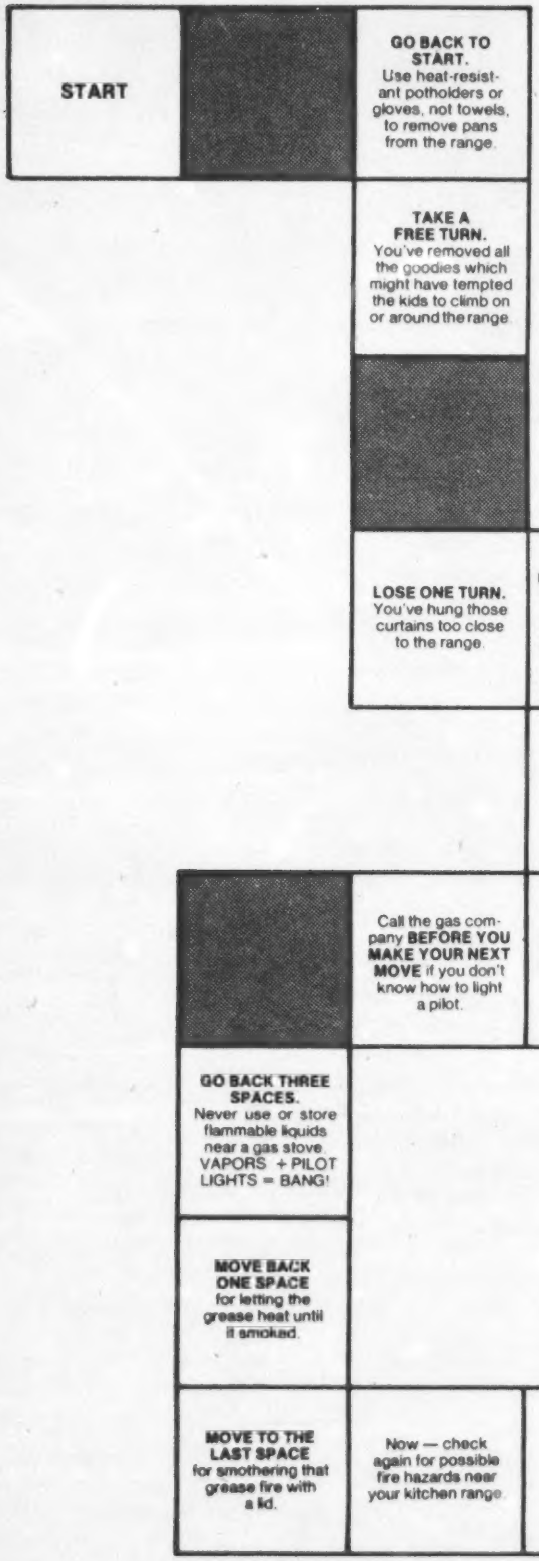
Electric ranges, originally developed and popularized in the 1930's, are also popular today. The cooking unit in this range consists of an electric wire embedded inside a metal sheath. The metal sheath is not designed to be a part of the electric circuit. The first electric ranges had only one heat stage and cooked more slowly than gas ranges. But today, electric ranges have been modified and improved. They can be used to cook food in about the same time as gas ranges, and unlike the earlier models, they come equipped with three or more heat stages.



Believe It or Not . . .

- Vapors from contact cement, gasoline, cleaning fluids, or other flammable liquids can be ignited by the pilot of your kitchen range.
- An electric burner coil can reach a temperature of more than 1,000 F°(537.7°C). This can ignite your clothing even after the coil has been turned off.
- Flammable fabrics, such as towels, dish rags, or curtains, can be ignited merely by being used or stored **near** a gas or electric range.
- Most kitchen range fires happen when clothing, particularly a loose fitting sleeve, catches fire when the victim is cooking or reaching across a range.
- An oven door can get hot enough to burn a youngster who might fall or lean against it. It can be particularly dangerous for a child just learning to walk who may use the door for support; the child is often unable to let go before suffering a burn. Keep small children out of the kitchen when the oven is in use.

AT HOME WITH YOUR RANGE


START
GO BACK TO START. Use heat-resistant potholders or gloves, not towels, to remove pans from the range.
TAKE A FREE TURN. You've removed all the goodies which might have tempted the kids to climb on or around the range.
LOSE ONE TURN. You've hung those curtains too close to the range.
QUICK! MOVE BACK ONE SPACE BEFORE YOU GET BURNED. You didn't check to see if the burner on your electric range was on.
MOVE AHEAD ONE SPACE if you always use the proper sized burner for each pot.
Call the gas company BEFORE YOU MAKE YOUR NEXT MOVE if you don't know how to light a pilot.
LOSE ONE TURN. Next time light that match *before* you turn the gas on.
Smell gas? Make sure the range is off, then call the gas company NOW!
GO BACK THREE SPACES. Never use or store flammable liquids near a gas stove. VAPORS + PILOT LIGHTS = BANG!
MOVE BACK ONE SPACE for letting the grease heat until it smoked.
MOVE TO THE LAST SPACE for smothering that grease fire with a lid.
Now — check again for possible fire hazards near your kitchen range.
FINISH. You're at home with your range!

RULES

1. Players must wear close-fitting clothes. (Loose-fitting clothes might catch fire near the range.)
2. Children cannot play the game!
3. Players must stand straight and face forward at all times. (Turning your back to the range or leaning against it while it's on is dangerous!)

OBJECT

The object of the game is to be safe at home with your range.

TO PLAY

Close your eyes, and let your finger fall on the number box below. Advance the number of spaces shown in the square closest to where your finger fell, and follow the instructions given in the space where you land. Repeat until you reach "finish." Use a coin or make a token to keep your place as you travel through the game.

1	2
3	4

CHECK BEFORE YOU CHOOSE

( ) Will the controls on the range be out of reach for young children?

( ) Do the knobs turn through a progression of temperature settings before coming to "maximum temperature?"

( ) Are the controls placed so that you don't have to reach across the burners to turn the range on and off?

( ) If the range is electric, does it have signal lamps that warn when the burners are on?

( ) Does the range comply with current voluntary standards for electric and gas ranges?

WHY? *

There are voluntary standards covering the manufacture of ranges. Have the dealer show you information that the range you are about to select meets electrical, gas, and thermal standards. These standards have been developed for your safety.

Range designs will vary, but look for controls that are out of reach for curious young children . . . controls that go through a progression of settings before coming to "max temp" . . . controls that must go through two movements before "on" position, such as "push and turn."

Fires and burns occur during range use, but many occur when the range is not in use for cooking: a child climbing on to the range; leaning over the range to reach a shelf or cabinet; leaning against the range for warmth purposes; accidentally turning on controls and touching hot oven doors.

*Some of this information taken from NBSIR 75-969, Accidents Involving Several Selected Appliances—Summary and Description Analysis, December, 1975

Detect a Note of Smoke Detector Sense . . .

Smoke detectors **SENSE** fire only a few minutes after it ignites . . . and **WARN** you several minutes before smoke becomes deadly.

Smoke detectors provide an early warning that could enable you and your family to **ESCAPE** and **REDUCE** the **LOSS** of your property.

Two types of smoke detectors are available:

—**IONIZATION CHAMBER DETECTORS** . . . sense flaming fires quicker than photoelectric detectors.

—**PHOTOELECTRIC DETECTORS**. . . sense smoldering fires quicker than ionization chamber detectors.

Whichever type you choose—**BUY** a smoke detector . . . or TWO!

Whatever you do—**PLACE** smoke detectors: near or on the ceiling . . . at the tops of stairs . . . in places where smoke is likely to pass as it rises . . .

AND

outside your bedroom doors. (The most important warning you need is when you are asleep.)

BE AWARE THAT ONE OF THE MOST IMPORTANT APPLIANCES IN YOUR HOME CAN ALSO BE ONE OF THE MOST HAZARDOUS.

Ovens and Cooking Ranges

A WORD ABOUT STOVE TOP FIRES . . .

To prevent them, keep the area around your kitchen range free of grease . . . AND don't heat grease until it smokes. You'll increase the chance of it splattering and catching fire. If you should have a fire:

DO turn the burner off.

DO cover the pan with a lid . . . carefully. Slide it on from the front, deflecting the flames away from you.

DON'T carry the pan to the sink.

DON'T ever use water on a grease fire.

Some people use baking soda to extinguish a grease fire. This works, but it must be readily available, and enough must be used to cover the fire entirely. Use the container as a shaker, starting at the front and working back, as it covers the flames.

If you can't cover the pan—or if you don't have baking soda—a dry chemical or carbon dioxide fire extinguisher will do the trick. However, stand back and deposit the powder or gas gently in the pan, so as not to scatter the fire. Also, buy a fire extinguisher that has been UL (Underwriters Lab) or FM (Factory Mutual) approved.

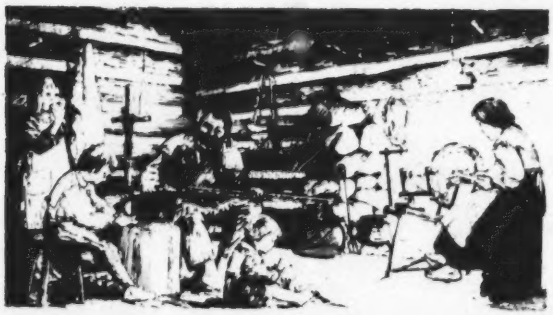
AND . . .

Read the instructions for the extinguisher *before* you have the fire. Keep it handy but not in the potential fire area.

CHAPTER 8

The Fireplace

Historical Highlight



A lot of people are nostalgic about fireplaces. They seem to have a romance all their own. And they should . . . because fireplaces were once the center of family life. Even in fairly modern times – on the American frontier – the fireplace was the only energy source in the home. It provided heat, light, and cooking facilities.

Abe Lincoln lived in a log cabin in rural downstate Illinois. And he is reported to have studied his law books before the open fireplace . . . and to have done his writing on the back of a fireplace shovel.

In larger homes, there were a number of fireplaces: there would be one in the living room, another in the library, and one in each bedroom. People burned logs in the open fireplace then because logs were the only fuel that was both available and suitable. Later, the more modern fireplace had "gas logs" – artificial logs, that is – which were really gas outlets. There are still many of these around today.

As homes began to be built with central heating, gas, and electricity, fireplaces started to disappear. While a few homes still had them, this was more for sentimental reasons than for anything else. But some of the "fireplaces" found in modern homes are not really fireplaces at all. That is, they do not have hearths, chimneys, dampers, and other things a fireplace needs. And it would be quite dangerous to lay a real fire in any one of these.

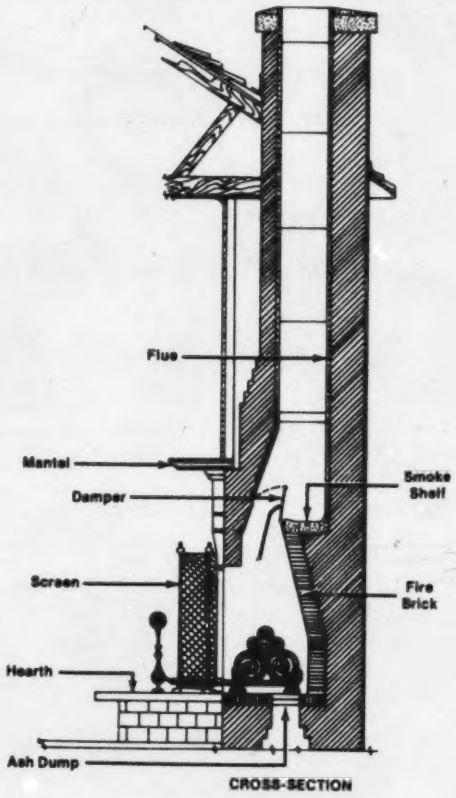
Fireplaces have begun to make a strong comeback today – partly because of the high cost and limited supply of energy. People are using them more and more. And with this increased use has come a host of new problems.

How Does A Fireplace Work?

A fireplace consists of three main parts: the *fireplace proper,* where fuel is actually burned . . . the *chimney,* where smoke and hot gases are expelled . . . and the *hearth* —a kind of apron in front of the fireplace, made of brick or some other nonflammable material.

Most of us think of a chimney as the structure that extends above the roof of a house. But in reality, it actually includes the part below the roof too.

Inside the chimney, there is a passageway—called a *flue*—through which smoke and hot gases travel. And since these gases are either at or above the temperature of the logs burning in the fireplace, the chimney must be lined with some fire-resistant material. In modern chimneys, a special material called *firebrick* is generally used for this purpose, or a fire-resistant liner is incorporated in the flue. For added protection, firebrick is also used quite frequently to line the interior walls of the fireplace itself. Through a process known as *convection,* smoke and heated gases rise naturally into the chimney. This draws fresh air from the room into the fireplace and through the logs, creating a draft. The effect grows steadily—the greater the fire, the more gases expelled, the more fresh air drawn in, the hotter the fire grows, and so on . . . until the fire literally begins to roar.



CROSS-SECTION

As you can see, such a process could—in a very short while—cause a fire to get out of hand. To prevent this from happening, the chimney has a *damper* just above the fireplace proper. A damper is a metal plate which can be controlled by a handle that closes off some of the flue or passageway in the chimney . . . thereby reducing the draft and controlling the combustion in the fireplace.

As the principle control of the fireplace, the damper must be used properly. If it is kept entirely shut, the fire may be oxygen-starved . . . and it is likely to expel smoke and gases into the room instead of up the chimney. The damper must be set so that the fire *draws* smoke and gases up the chimney and at the same time draws fresh air into the fireplace. And it must not be allowed to get so hot and roaring that it begins to throw sparks across the room. This is why a *screen* made of wire or special glass should be in front of the fireplace.

A blazing fireplace can be beautiful, but if it's not carefully understood and monitored, it can also be a killer.

Did You Know That . . .

- Sparks leaping from an open fireplace can ignite anything flammable in a room.
- Modern, artificial logs made of compressed sawdust and wax should be handled differently (used one at a time, not stacked) than natural logs because they generate more heat . . . and you should never mix the two.
- Charcoal and modern plastic packing materials (like polystyrene)—if burned in a poorly vented fireplace—generate poisonous and deadly gases (such as carbon monoxide).
- Using gasoline and other highly volatile, flammable solvents to encourage the fire in a fireplace causes the emission of invisible vapors that are themselves flammable and explosive. Remember, the relatively safe kerosene or fuel oil will behave like gasoline when vaporized by the heat of the fire.

MAP & HAZARD PRESENT THE "DO'S AND DON'TS" OF FIREPLACE SAFETY

DO use natural wood logs in preference to other materials. If you use artificial logs, be sure to follow prescribed safety precautions.

DO inspect your fireplace and chimney regularly and keep them clean and in good repair.

DO use a good fire screen in front of the fireplace . . . especially if you are burning highly resinous or damp wood.

DO keep the damper adjusted for a good enough draft to remove all smoke and gases . . . but without letting the fire get out of control.

DO keep the areas near the fireplace free of flammables . . . and educate all members of the family about the danger of flying sparks.

DO see to it that the fire is out before going to bed.

DO make sure that your fireplace is a real fireplace and not a "false front" intended merely for decoration.

DON'T stack artificial logs in the fireplace as you would wooden logs.

DON'T use your fireplace if it has loose bricks or if it needs cleaning.

DON'T burn coal, charcoal, or plastic materials in your fireplace unless it is properly vented . . . and **DON'T** burn trash in the fireplace. It's not an incinerator!

DON'T . . . DON'T EVER use gasoline or other flammable fluids to encourage a fire.

DON'T allow small children to get close to the fireplace . . . and make sure that any flammables in the room that can be treated for flame-resistance have been.

DON'T leave a fire unattended.

DON'T take the genuineness of your fireplace for granted. It may be a "fabulous fake" that looks like the real thing, without having the real ventilation system.

And if, in spite of all precautions dictated by knowledge and good judgment, the unexpected occurs and a spark ignites something flammable in the room . . . **DO** have a fire extinguisher close at hand. They are available in small, inconspicuous, convenient, and inexpensive models. A pressurized water-charged extinguisher is best for this type of fire (Approved for Class "A" fires).

What is Your "FLAME-ABILITY QUOTIENT" for Fireplaces?

Are you using and maintaining your fireplace in the safest way possible? Answer the following questions—yes or no—and calculate your *FAQ* . . . your ability to prevent unwanted flames. (Scoring information appears below the last question.)

	Yes	No
1. Does your fireplace have a flue—a passageway for smoke and gases to rise and be expelled through a chimney on the roof?	☐	☐
2. Is your fireplace cleaned and inspected regularly?	☐	☐
3. Do your children ever play around the fireplace area?	☐	☐
4. Do you ever use gasoline or other flammable fluids to ignite or increase your fire?	☐	☐
5. Does your fireplace have a hearth (a brick or stone apron) of ample size?	☐	☐
6. Do you ever use your fireplace to toast marshmallows or broil steaks?	☐	☐
7. Have you ever burned charcoal or incinerated trash in the fireplace?	☐	☐
8. Is your entire fireplace area free of flammable items?	☐	☐
9. Do you regularly check the operating condition of your fireplace's damper control?	☐	☐
10. Do you always keep a fire screen in front of your fireplace?	☐	☐
11. Are all carpets, upholstery, and other such flammables in the fireplace room made of flame-retardant materials?	☐	☐
12. Have you instructed your family—especially the very young or very old—about prescribed rules for fireplace safety?	☐	☐

Answers—You should have answered "Yes" to questions 1, 2, 5, 8, 9, 10, 11, and 12. For questions 3, 4, 6, and 7, the safest answer should have been "No." Tally up your score, giving yourself 10 points for each correct answer.

Evaluating Your FAQ

120 points—You're a real expert. Enjoy your fireplace with confidence!
90-110 points—So far, so good, but clean up your weak spots.
70-80 points—Be careful. You may have been lucky so far, but your FAQ does not inspire confidence.
Below 70 points—Your fireplace is a disaster. Fix it, board it up, or move!

CONSUMER CUES

Dear Cue:

My husband is getting terribly compulsive about fire hazards, and it's driving me up the walls. Sure I know that fire can be dangerous and that prevention is important . . . but is it really necessary to make "soot checks" around our fireplace? Please answer. I need help.

Signed,
Sort of Sooty

Dear Sort of:

Yes, you do need help. And I'm terribly sorry, but my answer will probably send you farther up the walls. Your husband is absolutely right; soot can be a real problem. The interior walls of your chimney (the flue) must be kept reasonably soot-free. A heavy accumulation of soot will reduce the size of the passageway where unwanted smoke and gases escape. It's also a serious fire hazard, since the soot could ignite . . . and obviously, a fire inside your chimney can be very dangerous. So keep up your "soot checks," and have your chimney cleaned regularly. It's the simplest safeguard against danger.

Sincerely yours,
Cue

Dear Cue:

I have three dogs, two cats, four children, and one fireplace. The combination is not only crowding . . . but terrifying. What should I do?

Signed,
Crowded & Nervous

Dear C & N:

Sorry, I can't help with your problems of over-crowding, but I can offer some advice that might ease your nerves. If you don't have a screen in front of your fireplace, get one there immediately. This should be enough to keep the animals away. As for the children, that might take a bit more doing. If your kids are old enough to understand, carefully explain to them why the screen is there, why it must never be touched or moved, and what can happen if it is. The best approach to use with very young children is to keep them away from the fireplace when you're not there to observe. Don't take chances or make assumptions. If you're not there to supervise . . . don't keep the fireplace burning.

As always,
Cue

Dear Cue:

Every Christmas we have the same quarrel. Can we or can't we hang stockings over a lit fireplace?

Signed,
Curious

Dear Curious:

Many people do hang Christmas stockings over a lit fireplace. This can be dangerous. The danger is increased if you use highly resinous or damp logs in your fireplace, because they can throw off tiny sparks that can eventually ignite an entire room.

Sincerely,
Cue

If you need safety information on flammables and ignition sources, write to: Consumer Cues, Bureau of Information and Education, U.S. Consumer Product Safety Commission, Washington, D.C. 20207.

Or call, toll-free: (800) 638-2666. Maryland callers only, call (800) 492-2937.

"Reflections of An Older Sister"

Troy was just a baby when it happened . . . not even three years old. Now he's in his twenties, and except for physical signs, he can't even remember anything about it.

I wasn't so lucky, though. I can remember it as though it were yesterday. Maybe it's because I'm six years older . . . or maybe it's because I was the reason that it happened. Me and the fireplace, that is.

It was January, and we had been playing in the snow all morning. Both of us were chilled and uncomfortable, and I thought I had an ideal way to warm us.

We had a big fireplace in our living room then. It was always lit, since it was the only source of heat for our house. I can remember thinking of how my parents and older brother would warm themselves by the fire. And naturally, I thought it would be perfectly logical for Troy and me to do the same.

I remember dragging two stools close to the fireplace . . . sitting down . . . taking off my shoes . . . and dangling my soaked feet over the warm and soothing blaze. And I recall telling my little brother to do the same.

That was 25 years ago . . . long before there were rules and regulations about flame-resistant fabrics; long before people were really aware of the proper use of fireplaces. Or should I say long before my family was aware?

As I sat by the fire warming my frozen toes, I turned around and saw my little brother. A spark had caught on his trouser leg, and flames were shooting high above his tiny head.

Mom and Dad had never taught us about dropping and rolling . . . or about smothering fires with rugs or blankets or coats. So I ran out of the house . . . screaming as loud as I could. And Troy was running and screaming right alongside of me. (Little did I know at the time that running only fed the fire with oxygen!)

I remember thinking that it took forever, but it was only an instant later that Mom ran into the yard. She threw herself on my brother—who was by this time a mass of flames—and finally the fire died.

I'm a mother myself now. We don't even have a fireplace in our house, but my three children are being taught all necessary information about the safe and proper use of fireplaces. If they should ever visit a home where there is a fireplace, they'll know what to do — and more importantly—what not to do. I won't even have to be there to tell them.

Well, that's my story. You might say that I learned my lesson the hard way. But at least now I'm confident that my family knows and practices the rules of fireplace safety . . . Does yours?

CHAPTER 9

Flammable Liquids

Historical Highlight

Flammable liquids have been part of man's life since ancient times. For example, it has been known for thousands of years that certain oils could be put into a container, given a wick, and set afire to provide heat and light.

Alcohol is used in many forms for many purposes. Some foods are served "flaming," covered with liqueur that has been set afire. Alcohol is also used in various types of lamps, such as the small alcohol lamps used in some home chemistry sets. In fact, there are more than 12 different government formulae for denatured alcohol alone . . . some of them highly flammable.

Turpentine is one of the two most common paint thinners. (Water is the other.) Turpentine and some paints are flammable. The number of pigments and synthetic resins used in making paint has grown since the concentrated research efforts during World Wars One and Two and the research boom of the 1960's.

Kerosene lanterns often appear in illustrations of American homes during the 19th century. The "hurricane lamp" is an increasingly popular device using kerosene or another flammable liquid. Kerosene also has been used to power various motorized equipment.

Gasoline is used not only for automobiles, but also in some power lawnmowers and in a variety of machinery and equipment. The U.S. Consumer Product Safety Commission calls this "the most commonly used—and misused—flammable liquid." It has been in widespread use since the early 1900's, beginning with mass-production of automobiles powered by the gasoline-fueled internal combustion engine.

Some flammable liquids are the products of more recent technology. An example is the fuel (butane, benzine) used in cigarette, cigar, and pipe lighters. Another is mimeograph stencil correction fluid that is used in many offices—and which becomes even more of a safety hazard when left standing open on a desk.

The National Fire Protection Association reported the existence of more than 7,300 trade name liquid products in 1972 . . . three times the number they had listed in 1954. Many of these are flammable. Unfortunately, along with the growing number of flammable liquids in existence, there has been an increase in the number and severity of accidents and injuries associated with them.

What is a Flammable Liquid?

The term "flammable liquid" is its own definition: it is a liquid that will burn. A second characteristic is that most flammable liquids will readily evaporate . . . even more readily than water. It is this ability to change from a liquid to a gaseous (vapor) state that makes flammable liquids so dangerous when mixed with air.

The majority of these liquids are distilled from crude oil and include gasoline, kerosene, "mineral spirits," benzine (dry cleaning fluid), and more.

What is a Flash Point?

A flash point is the lowest temperature at which the vapors from a flammable liquid will ignite. Of course, there are different flash points for different liquids. Gasoline, for example, emits flammable vapors even at temperatures below zero.

Don't find a flammable liquid's exact flash point from experience. Keep these liquids in closed containers and away from sources of heat.

Detect a Note of Smoke Detector Sense ...

Smoke detectors **SENSE** fire only a few minutes after it ignites . . . and **WARN** you several minutes before smoke becomes deadly.

Smoke detectors provide an early warning that could enable you and your family to **ESCAPE** and **REDUCE** the **LOSS** of your property.

Two types of smoke detectors are available:

—**IONIZATION CHAMBER DETECTORS** . . . sense flaming fires quicker than photoelectric detectors.

—**PHOTOELECTRIC DETECTORS** . . . sense smoldering fires quicker than ionization chamber detectors.

Whichever type you choose—**BUY** a smoke detector . . . or TWO!

Whatever you do—**PLACE** smoke detectors: near or on the ceiling . . . at the tops of stairs . . . in places where smoke is likely to pass as it rises . . .

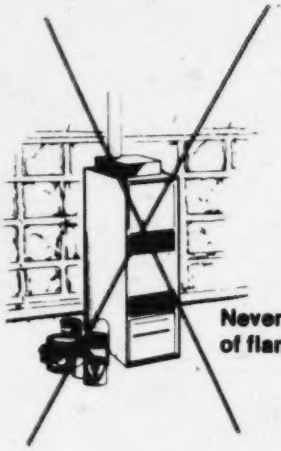
and

outside your bedroom doors. (The most important warning you need is when you are asleep.)

Did You Know That . . .

- Flammable liquids are not only a fire hazard, but are dangerously explosive.
- Vapors from flammable liquids are heavier than air; they can flow invisibly along the ground and be ignited by a far-off flame, spark, or heat source. The vapor trail acts as a wick!
- Oil-soaked rags or clothing are especially flammable and must be stored in a covered, metal container.
- Flammable liquids should only be used in well-ventilated areas—preferably outdoors.
- Even in cold weather, vapors can escape from an open flammable liquid container.
- Gasoline-powered equipment must be turned off and cooled before being refueled to prevent ignition of gasoline vapor.
- Water must never be used on a flammable liquid fire because it can cause the fire to spread or explode.
- Local regulations often prohibit the storage of large amounts of gasoline in inhabited buildings.
- Persons receiving flammable liquid burn injuries must often be admitted to a hospital for extensive and painful treatment.

Some Basic Tips for Flammable Liquids



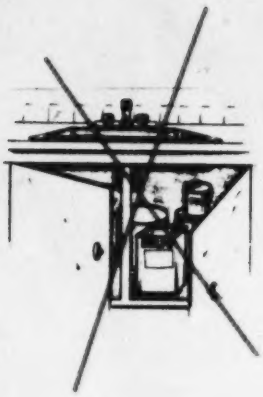
Never use or keep a flammable liquid near a source of flame or heat.

Don't add fuel to a charcoal fire after it's started, because flames could travel up to the can and cause it to explode. Never use gasoline to start a charcoal fire.

Never store gasoline in your home or car. Flammable liquids must be kept in well-ventilated areas.

If you must siphon gasoline, use a hand-operated pump—*not* your mouth.

Gasoline should be stored in tightly-capped and labeled safety cans that have flame arresters and pressure-relief valves—never in glass or plastic jugs.

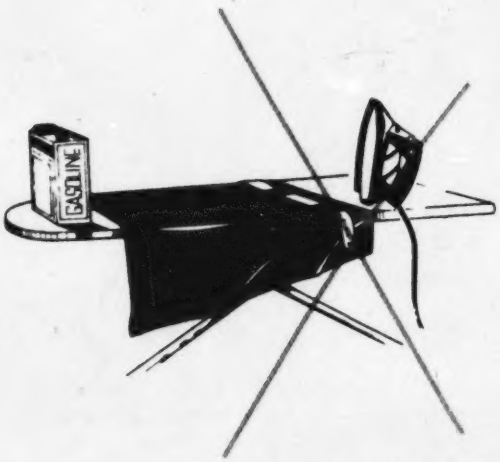


Keep flammable liquids out of the reach of children.

Use only Class "B" fire extinguishers (foam, carbon dioxide, or dry chemical) to put out a flammable liquid fire.

Never incinerate or puncture pressurized containers.

Read directions when using a spot remover, and avoid using near a heat source.



Gasoline is not to be used as a cleaning agent.

If a flammable liquid spills, clean it up immediately. Better yet, use a safety can . . . it won't spill. Be *very* careful with charcoal fires. Always use them outdoors and treat the lighter fluid like gasoline.

Check Your Home for Hazardous Liquids . . .

Some flammable liquids have a legitimate reason to be in the home; most do not.

Which of the following liquids do you keep around the house? Which are you using and storing properly? Which should you dispose of?

Gasoline—

Never store gasoline in your home. At most, a gallon or two may be kept in a cool location—like your garage—but only in a suitably marked, tightly closed metal container.

Benzine—

You may have a good reason to have benzine in the house—as a dry cleaning fluid or as a fluid for your cigarette lighter. Even then, you should keep the smallest quantity possible on hand . . . in a tightly stoppered container . . . stored securely away in a cool place. Benzene (with an "e"), otherwise known as benzol, is a very serious fire and health hazard. Do not use or store it under any circumstances.

Denatured Alcohol—

Denatured alcohol may be required for some uses in the home—perhaps as a rubbing solution. While it is not quite as dangerous as some of the hydrocarbons, it is nonetheless highly flammable and should be used and stored with as much caution as any other flammable liquid.

Paint Sprays, Removers, Synthetic Thinners, Quick-Drying Paints—

These can be very dangerous products because they evaporate easily, and their vapors will accumulate in a closed room. Use them out of doors only, and store them in labeled, tightly-capped metal containers. Do not breathe the vapors.

READ AND HEED LABEL WARNINGS ON ALL PRODUCTS!

Whenever possible, choose products that are non-flammable and non-toxic. Read labels carefully and follow the directions for use and storage.

DISASTER!

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CHAPTER 10

LIGHTERS

Historical Highlight

In a sense, lighters are among man's oldest inventions. The basis for most lighters is flint—a hard stone that gives off sparks when struck sharply—and "tinder"—with a flammable liquid usually serving as tinder.

Early man learned that if he arranged a bed of tinder—a dry combustible material—and struck a flint with a stone so that the sparks fell on the tinder, he could cause the tinder to ignite.

In later times, people carried a "tinder box." This was a small container of tinder, fitted with a piece of flint and a piece of steel with which to strike the flint and generate sparks.

Lighters developed more recently use the same basic idea of flint and steel. The flint is held against a file-like wheel by a spring, and the wheel is rotated, either by the thumb or by a thumb-powered lever . . . striking sparks from the flint. The sparks fall on a wick—wet with benzine or a similar flammable liquid—and cause ignition.

Later models have improved on this basic apparatus by using butane—a flammable gas—as tinder. Butane lighters have achieved great popularity in recent years—both because they light more dependably than do the older types and because they are less messy to fill and use.

Other lighters have recently been introduced, and a number of these have done away with the time-tested flint and steel. These lighters appear in our cars, in our pockets, on our living room tables . . . anywhere at all where lighters are convenient and easy to use.

From the Mouths of Victims

"My husband gave me a little heart-shaped lighter for my birthday. I liked people to see it, or I probably would have gotten rid of it a long time ago. It was a nuisance—always pulling against other things in my purse ... always leaking on my hands and clothes. It never even occurred to me that this was dangerous, but one day it finally happened. I was wearing gloves in a restaurant when I tried to light my cigarette with the lighter. Suddenly the fingers of my glove burst into flames. My friend poured a glass of water on my hand before the flames spread, but I burned my hand pretty badly.The doctor said that when clothing catches fire first the burns are usually even more serious. I'll never do anything stupid like that again. Lighters are cheaper to replace than fingers!"

"I'm only ten years old, but Mom says that's old enough to watch my brother, Michael. He's two, and he gets into everything. Michael doesn't like his own toys too much, but he does like other things he thinks are toys. His favorite thing is Mom's fish. It's not really a fish ... it just looks like one. It's really a lighter Mom's friends use to light their cigarettes. Mom keeps it on the table in the living room. One time when I wasn't watching Michael very well, he started to play with the fish. I never showed him how it works, but somehow, he made it light anyway. The fire caught on his pajamas. I saw it and rolled him on the floor in the carpet real fast. The fire went right out. Mom said that it's because Michael's pajamas comply with the standards for the flammability of children's sleepwear. Michael wasn't burned at all, but he sure was scared. A firefighter came and told me how important it is to keep little kids away from matches and lighters. He told Mom to put that fish where Michael can't get it. Lighters aren't toys, but dumb old Michael doesn't know that!"

"My old hands won't work well enough to light a match anymore. My daughter brought me this lighter for my cigars. While I'm having my cigar, I like to sit and look out my window to a park where the young kids are playing. The lighter is okay, but it doesn't turn itself off. And my hands aren't quick at doing that anymore. Last week when I was having my smoke, I caught the curtains on fire. I dropped the lighter on the floor, and the curtains went right up in flame. One of my grandsons was just coming to visit me, and he beat the fire out. But not before little pieces of the burning curtain fell on my arms and head. Even though I have blisters all over, I know I was lucky it wasn't worse. I guess I'll have to use that lighter when my family's around now."

"I had a freak thing happen to me. I lost my cigarette lighter, so I picked another one up at the drug store last week. I wanted to smoke on my way back to the office, but the wind was blowing. I had to cup my hand around the cigarette, and hold the lighter close to my face. I didn't expect the flame to shoot up like it did, but the wind didn't help either. I was wearing a straw hat. The whole brim went up in flames. I got the hat off, but not before it burned some of my hair. I never thought to check how high the flame was going to be on the new lighter. I think it was too high to be safe, even without the wind. Anyway, I'm going to write to the manufacturer. That was a freak thing to happen, all right, but it could happen to anyone. The next person could be badly burned, not just scared like me."

PICTURE YOURSELF SAFE

- Hold your away from your when you're igniting it.

- Don't use a when you're or

- Never put a away until its is extinguished.

- Teach the dangers of using a

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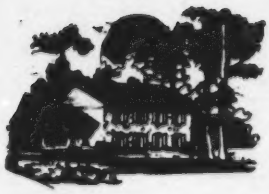
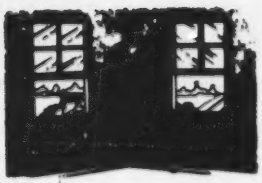
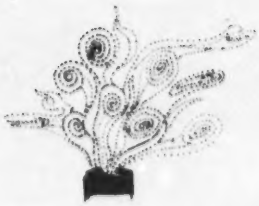
- Don't use a near

- When you're filling a , clean up before you use it.

- Check your regularly for

- Fill your only  or in 

to prevent  from building up.

Hap & Hazard Shop for Lighters

Hap

Hazard

HAZARD: The important thing to remember when you're shopping for lighters, Hap, is to buy only what you need.

HAP: That's right. A small pocket lighter works just as well as a big colorful table lighter . . .

HAZARD: . . . which might get into the wrong little hands, if you know what I mean.

HAP: A lighter should be easy to fill. People forget that spilled fluid and escaping vapors can cause fires and explosions.

HAZARD: The safest lighter is one that is self-extinguishing. We all have "butterfingers" sometimes.

HAP: Besides, very old and very young people might not be able to react quickly enough if they do drop a lighter.

HAZARD: We have to remember to buy lighters with small flames, too. Big flames are pretty, but they're harder to control.

HAP & HAZARD: Remembering these simple things when you're shopping for lighters will help you plan ahead to avoid accidents.

Appendix
Where to Go for More Information

U.S. Consumer Product Safety Commission
Office of Communications
Washington, D.C. 20207

Write for free catalog.

Consumer Product Safety Commission Area Offices:

Atlanta Area Office
Consumer Product Safety Commission
1330 West Peachtree St., N.W.
Atlanta, Georgia 30309
404-526-2231
(Ala., Fla., Ga., Ky., Miss., N.C., S.C., Tenn.)

Boston Area Office
Consumer Product Safety Commission
100 Summer St., Rm. 1607
Boston, Massachusetts 02110
617-223-5576
(Conn., Mass., Me., N.H., R.I., Vt.)

Chicago Area Office
Consumer Product Safety Commission
230 S. Dearborn St.
Rm. 2945
Chicago, Illinois 60604
312-353-8260
(Ill., Ind.)

Cleveland Area Office
Consumer Product Safety Commission
Plaza Nine Bldg.
55 Erieview Plaza, Room 520
Cleveland, Ohio 44114
216-522-3886
(Mich., Ohio)

Dallas Area Office
Consumer Product Safety Commission
Rm. 410C, 500 South Ervay
Dallas, Texas 75201
214-749-3871
(Ark., La., N.M., Okla., Tex.)

Denver Area Office
Consumer Product Safety Commission
Suite 938, Guaranty Bank Building
817 17th Street
Denver, Colorado 80202
303-837-2904
(Colo., Mont., N.D., S.D., Ut., Wyo.)

Kansas City Area Office
Consumer Product Safety Commission
Suite 1500, Traders Nat'l Bank Bldg.
1125 Grand Avenue
Kansas City, Missouri 64106
816-374-2034
(Ia., Kan., Mo., Nebr.)

Los Angeles Area Office
Consumer Product Safety Commission
3660 Wilshire Boulevard, Suite 1100
Los Angeles, California 90010
213-688-7272
(Ariz., So. Cal.)

Minneapolis Area Office
Consumer Product Safety Commission
Rm. 650, Federal Bldg., Fort Snelling
Twin Cities, Minnesota 55111
612-725-3424
(Minn., Wis.)

New York Area Office
Consumer Product Safety Commission
6 World Trade Center
Vesey Street, 6th Floor
New York, New York 10048
212-264-1125
(N.J., N.Y., P.R., V.I.)

Philadelphia Area Office
Consumer Product Safety Commission
10th Floor, 400 Market Street
Philadelphia, Pennsylvania 19106
215-597-9105
(Del., D.C., Md., Pa., Va., W.Va.)

San Francisco Area Office
Consumer Product Safety Commission
Suite 500, 100 Pine Street
San Francisco, California 94111
415-556-1816
(Hi., Nev., No. Cal.)

Seattle Area Office
Consumer Product Safety Commission
3240 Federal Building
915 Second Avenue
Seattle, Washington 98174
206-442-5276
(Alas., Ida., Ore., Wash.)

Safety Section
National Institutes of Health
9000 Rockville Pike
Bethesda, Maryland 20014
Brochures, pamphlets, films (as related to research institutions).

National Fire Protection Assoc.
Publications Department
470 Atlantic Avenue
Boston, Massachusetts 02210
Films, filmstrips, brochures, posters. Write for catalog and price list.

Manufacturing Chemists Assoc., Inc.
1825 Connecticut Avenue, N.W.
Washington, D.C. 20009
Posters, brochures (especially relating to safety in the science laboratory, safety data sheets and guides).

National Safety Council
444 N. Michigan Avenue
Chicago, Illinois 60611
Pamphlets, brochures, annual accident rate reports.

American Insurance Association
85 John Street
New York, New York 10038
Brochures, pamphlets on fire safety. Write for publications list.

American Gas Association
1515 Wilson Boulevard
Arlington, Virginia 22209
Brochures, pamphlets on fire safety.

Underwriters' Laboratories, Inc.
207 E. Ohio Street
Chicago, Illinois 60611
Brochures, pamphlets on electrical safety standards, fire extinguishers, fire doors.

Research and Production Division
Office of Public Affairs
Department of Housing & Urban Development
Room 9243, HUD Building
Washington, D.C. 20410

International Assoc. of Fire Chiefs, Inc.
1329 18th Street, N.W.
Washington, D.C. 20036
Pamphlets, brochures on fire safety procedures.

Aetna Life & Casualty Companies
One Civic Center Plaza
Hartford, Connecticut 06156
Brochures, pamphlets on fire safety. Write for list.

American Mutual Liability Insurance Co.
Wakefield, Massachusetts 01880
Brochures, pamphlets on fire safety. Write for list.

Liberty Mutual Fire Insurance Company
175 Berkeley Street
Boston, Massachusetts 02117
Brochures, pamphlets on fire safety. Write for list.

National Fire Prevention and Control Administration
Public Education Office
Department of Commerce
P.O. Box 19518
Washington, D.C. 20036
Write for Fire Research reports, resource catalogs, and directories, recording fire education materials

Hartford Fire Insurance Company Group
Hartford, Connecticut 06115
Brochures, pamphlets on fire safety. Write for list.

Fire and Accident Prevention Division
General Services Administration
18th & F Streets, N.W.
Washington, D.C. 20005
Pamphlets, brochures, fire safety hints, booklets on family safety, handbooks.

Occupational Safety and Health Admin.
Department of Labor
200 Constitution Avenue, N.W.
Washington, D.C. 20210
Brochures on safety in using hand power tools, solvents, etc.

National Smoke, Fire, Burn Institute, Inc.
Suite 833, 53 State Street
Boston, Massachusetts 02109

Your state or local health department

* U. S. GOVERNMENT PRINTING OFFICE : 1977 729-465/1407

Home Safety Check

Check your house or apartment room by room to see which of these fire hazards you find. Then take action to correct them.

Kitchen

____ Matches within easy reach of children.

____ Overloaded outlets or extension cords.

____ Curtains or towel racks close to the range.

____ Flammable liquids (cleaning fluids, contact adhesives, etc.) or aerosols stored near the range or other heat source. Remember, even a pilot light can set vapors on fire. Dispose of outdated or empty cans properly.

____ Attractive or frequently used items stored above the range where someone could get burned reaching for them (especially small children in search of cookies or other goodies).

____ Worn or frayed appliance or extension cords.

Living Room, Family Room, Den, and Bedrooms

____ Matches and lighters within reach of young children.

____ Too-small or too-full ashtrays. Ashtrays should be large, deep, and emptied frequently, but only when all signs of heat and burning are gone.

____ Unscreened, uncleaned fireplace.

____ Worn or frayed extension cords or other electrical cords.

____ Extension cords run under rugs and carpets or looped over nails or other sharp objects that could cause them to fray.

____ Insufficient air space around TV and stereo that could cause them to overheat and start a fire.

____ Curtains, furniture, papers near a space heater.

____ Overloaded outlets or extension cords.

Basement, Garage, Storage Areas

____ Piles of stored newspapers or other rubbish. Newspapers stored in a damp, warm place may ignite spontaneously.

____ Oily, greasy rags. If these must be stored, they should be kept in labeled and sealed non-glass containers, preferably metal.

____ Flammable liquids (varnish, paint remover, paint thinner, contact adhesives, cleaning fluids) stored near workbench or pilot light and in anything other than labeled, sealed metal containers. Dispose of outdated or empty cans properly.

____ Gasoline stored in the house or basement. It should be stored away from the house (in an outbuilding) and only in safety cans that have flame arresters and pressure release valves.

____ Overloaded outlets or extension cords.

____ Fuses of the wrong size.

Have you seen anyone—

____ Cooking while wearing clothes with loose, floppy sleeves or full, billowing tops or skirts that may catch fire?

____ Using gasoline to start a fire in the grill or adding lighter fluid to an already-started fire?

____ Smoking in bed, in a chair, or on the sofa when tired, drinking, or under medication?

____ Spraying aerosols while smoking or near a space heater, range, or other ignition source?

____ Smoking while using a cleaning fluid, a paint thinner, or another flammable liquid?

____ Using a cigarette lighter after spilling fluid on the hands or clothing?

____ Reaching over a range or climbing onto a range to get something stored above it?

____ Leaning against a range for warmth or standing too near a heater or fireplace?

____ Inviting a small child to blow out a match?

____ Cooking without long hair tied back?

____ Peering into a closet with a lighted match, lighter, or candle?

____ Attempting to extinguish a grease fire with anything but baking soda or a lid?

____ Playing with matches or lighters? Small children do this frequently—and so do some adults.

These actions are dangerous. Ask your family to stop—for their own sake and for yours.

More in the Hap & Hazard Series . . .

Additional materials in this series on flammable products and ignition sources are available from the U.S. Consumer Product Safety Commission. These include:

- **A Guide to Flammable Products and Ignition Sources for Adult Consumers**

  Adult groups will find this Guide a useful tool for widespread communication of information on flammables and ignition sources. Emphasis is placed on eight products and how consumer groups can actively learn and communicate safety information and awareness.

- **A Guide to Flammable Products and Ignition Sources for Elementary Schools**

  Presents activities and materials that elementary school teachers can use to incorporate information about flammable products and ignition sources into the regular school curriculum. For added convenience, activities are directly referenced to chapters of *Fire In Your Life* . . . so users of the Guide won't have to look far for facts about flammables. Best of all, this Guide will make teaching—and learning—about product safety a valuable experience for all.

- **A Guide to Flammable Products and Ignition Sources for Secondary Schools**

  Presents activities and materials that secondary school teachers can use to incorporate information about flammable products and ignition sources into the regular school curriculum. For added convenience, activities are directly referenced to chapters of *Fire In Your Life*. . . so users of the Guide won't have to look far for facts about flammables. Best of all, this Guide will make teaching and learning—about product safety a valuable experience for all.

- **The Hazard Hunt**

  Take a *Hazard Hunt* through every area of the home with this new educational program on flammable products and ignition sources. Learn about safety with useful transparencies and script for use by schools, adult groups, and youth groups. It can be used separately or in conjunction with the other materials in this series on loan from the nearest CPSC area office.

Other materials available from the Commission include the Fire and Flammability Packet which contains a variety of fact sheets, four illustrated brochures—Flammable Fabrics and the Elderly; Gasoline is Made to Explode; Hazards of Flammable Liquids; Wake Up! Smoke Detectors Can Save Your Life If . . . .—and a Guide to Fabric Flammability.